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APPENDIX H

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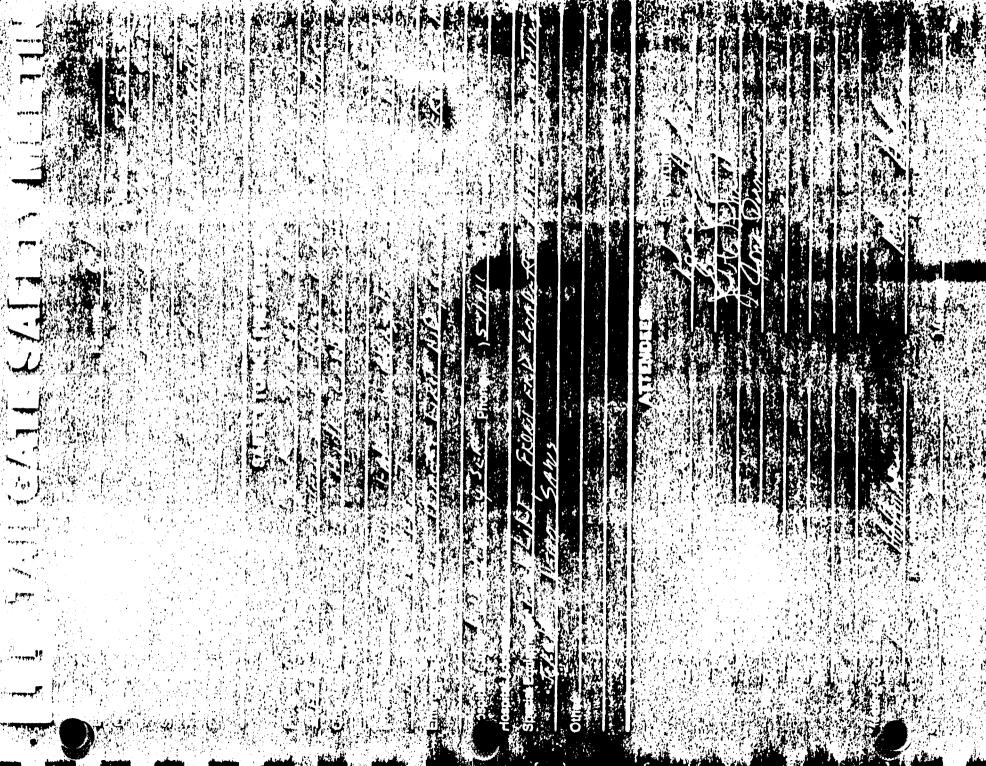
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APPENDIX I Copies of Manifests



HAZARDOUS WASTE MANIFEST (As Required By The Alabama Department of Environmental Management)

INTEGRAM HAZARDOUS WASTE MANIFEST Generatory Name and Manifest Generatory Photos Generat	rint or type. : (Form designed for use on elite (12-pitch) ty	pewriter.)		Form	Approved. OM	B No. 2050-0039. Expired	9-30- 91
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HAZARDOUS WASTE MANIFEST

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ZARDOUS WASTE MANIFÉS (As Required By The Alabama Department of Environmental Management) 4.69 Form Approved. OMB No. 2050-0039. Expires 9-30-91 (Form designed for use on elite (12-pitch) typewriter.) Information in the shaded areas is not required by Federal UNIFORM HAZARDOUS 1. Generator's US EPA ID No. Manifest 2. Page 1 Pocument No. WASTE MANIFEST T D 9 PRATT & WHITNEY (MS 1220 16) 400 MAIN STREET, EAST HARTFOIRD, CT 06108 US EPA ID Number Designated Facility Name and Site Address US EPA ID Number CHEMICAL WASTE MANAGEMENT, INC. **Emelle Facility** Alabama Highwey 17 at Mile Marker 163 0 0 0 0 6 2 2 2 4 6 4 205/652 Emelle, Alabama 35459 12. Containers 13. 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) Total Quantity Туре PO. HAZARDOUS WASTE, SOLID, **WA9189 (FOOL, FOO7** 52286 **CWM Profile Number CWM Profile Number CWM Profile Number** Work Order #: Purchase Order #: 16 GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that Lineve selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment. OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford Printed/Typed Name Sionatur Month Day 1 Pressure A A A A A Community Concept of Materials Printed/Typed Name Month Day Printed/Typed Name Signature Month Day 19.Discrepancy Indication Space $M_{\rm CM} M_{\rm CM}$

20.Facility Owner or Operator: Cartification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Signature

Month Day

1:1-1

Yes

Printed/Typed Name



HAZARDOUS WASTE MANIFEST

	lequired By The Alabama Dep	artment of Envi		. •	•	()
e print or type. If form designed for use on elite UNIFORM HAZARDOUS	1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1	Informati	No. 2050-0039. E on in the shac required by	led areas
WASTE MANIFEST 3. Generator's Name and Mailing Address	 	10206	of A Santa Bri	law.	more Number	
PRATT & WHITNEY OR 122-	-1K1		SEMI	ME 4	76055	y Car
GAOD HAIN STREET, EAST H	· ·					K Fr
5. Transporter 1 Company Starte 565		ID Number	C. Sugar			Y AIR
7. Wattagorius & Configuration Names & -//		VID dyurdbay 6 7	E Start Ja	7.5	201-1/2 - 0 + 81	
9. Designated Facility Name and Site Addres	10 US EPA	ID Number	.G. State For	The state of the s		
CHEMICAL WASTE MANAGEMENT, IN		(IS Nember				137
Emelle Facility Alabama Highway 17 at Mile Marker 163	إ ۸ إ د إ ٢٥ إ ٥ إ ٥ إ	6:2:2:4:6:4	205/8	52-97		
Emelle, Alabama 35459 11. US DOT Description (Including Proper Shippin		12. Cont		13. Total	14. Unit	
a.	g rooms, research cross, and to realizery	No.	Туре С	Duantity	Wi/Vo	
RO, HAZARDOUS WASTE SOLLI			ے ا	1/2/ 1		
h	J 52	286	C H	440	D (180	72001
5 .	,					
C.	CWM Profile Number					
. 	CWM Profile Number					
 \$:		*.	•		
J. Additional Descriptions for Materials Lists	CWM Profile Number		K. Hendling	L L L		
STRIP OF ORIGIN CORRECTION ALABAMA WASTE COLE COM305 15. Special Handling Instructions and Addition	590-0055		b.		4	
Work Order #: CO 16 GENERATOR'S GERTIFICATION: I hereby proper shipping name and are classified, pact according to applicable international and nation of the area of the economically practicable and that I have select future threat to human health and the environ the best waste management method that is a	ked, marked, and labeled, and are in all resonal government regulations. It I have a program in place to reduce the voited the practicable method of treatment, strainent, OR, if I am a small quantity generato waitable to me and that I can afford.	pects in proper conditi fume and toxicity of worage, or disposal curri	ion for transpo raste generate ently available	rt by highwa d to the degr to me which	ee I have determ minimizes the pr aste generation a	esent and and select
Printed/Typed Name	Signature	1. 2.		1. 1.1	Month √ D 1	Day Year OBBB9
17.Transporter Acknowledgement of Receip	ot of Materials					IU.F.V
MICHIONS H. KADING	Signature	URK	han .		Month v i u	Day Year
18.Transporter 2 Acknowledgement of Receip	ot of Materials		y			PPI
Printed/Typed Name	Signature				Month	Day Year
19.Discrepancy Indication Space						!!!
20.Facility Owner or Operator: Certification of	f receipt of hazardous materials covers	d by this manifest		ad in ba-		
Printed/Typed Name	. Signature	u by this manifest	except as no	ted in item	Month	Day Year
The same of the sa	1.5	in La		<u> </u>	11/121	115%
PA Form 8700-22 (Rey. 9-86) Previous edition is obsolete.	TRANSPORTER NO. 2 (or File C	nov) (Must Accor	npany Ship	ment)		

HAZARDOUS WASTE MANIFEST (As Required By The Alabama Department of Environmental Management)

	pitch) typewriter.)				Form Approved. OM	——	
UNIFORM HAZARDOUS 1. WASTE MANIFEST	Generator's US EPA ID No.		nifest nent No.	2. Page		ion in the required	shaded area by Federa
PRATT & WHITHEN WE 122-12) 400 HAIN STREET, EAST HART Generator's Phone (202)		3102	0 6 8	2	WILE A	7605	6 # 2 * * * * * * * * * * * * * * * * * * *
Transporter Company Name		PA ID Number	•				LHA
Trensporter 2 Company Name	NT DOS S	PA ID Number		A Sum	Transported	织物	7129
Designated Facility Name and Ente Address-	10. USE	PA ID Number	<u> </u>	G Same	Feedby's D		
Emelle Facility Alabama Highwey 17 at Mile Marker 163 Emelle, Alabama 35459	A L D 0 0	0 6 2 2	4 6 4		Mys Mars 5/652-97	7	
US DOT Description (Including Proper Shipping Na			12. Cont		13. Total Quantity	14. Unit Wt/Vo	
RO, HAZAROOUS WASTE SOLID,	N.O.S.			.,,2			
	MM Pinciladiumber	52286 F	701	CA	21210210	P	
CI	VM Profile Number		1 1		1111		
CV	NM Profile Number		بلل				
+ C1	NM Profile Number		*	*			
Additional Descriptions for Materials Listed Alegaria, GP ORIGIN CONSISTICUT LINOUR WASTE CODE CHR030590				K. Heni a. b.	Ĺ	•	
k Order #: GENERATOR'S CERTIFICATION: I hereby decliproper shipping name and are classified, packed, according to applicable international and national if I am a large quantity generator, I certify that I have selected to future threat to human health and the environment	Purchase Order #: are that the contents of this consignarized, and labeled, and are in all rigovernment regulations are a program in place to reduce the he practicable method of treatment.	volume and to storage, or disp	xicity of woosal curr	on for tra aste gen ently ava	ensport by highwerated to the deg	ree I have de n minimizes ti	he present an
the best waste management method that is availa Printed/Typed Name	Signature				• 4	Mo	nth Day
rallipater Wideland og medical design of	Materials	//			5- C		Z1(1)11
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	Materiale	2007					
Transporter 2 Acknowledgement of Receipt of						Мо	nth Day
Transporter 2 Acknowledgement of Recipt of Printed/Typed Name	Signature	/	100	+		12	 ロムにし
	Signature	, ('	100	;	·		26EL
Printed/Typed Name	Signature	V	<u> </u>	, 	-		2bil

APPENDIX J Copies of Receipts

Profit center DATE OFF SCHOOLSELY DATE:	12-05-89 12-05-89		T TICKET	TA	Numi TIME IN: SCHEDULE!	100	56739 09: <i>0</i> 1
TRUCK NUMBERS TRAILER NUMBERS LOAD TYPE:	SEALAND DATE		09:12 13:37 12	12/05(R)s TARE NET /06/89) .	io LB	• •
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COMMENTS:							
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Approvals:		Date:		Time:			
CR Waste:	Sample	er:		Technici	an:		,
al Method:	D81/T45-D81 (Circle One)	D	isposal Meth	od (Other): _			
1ix Ratio:/	(Waste)	Do	ensity:	(Tai	nker Only)	· · ·	
· Vash Pad Release:	Signature	R	eleased For I	Disposal By:	Signature	4	

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TRUCK NUMBER: TRAILER NUMBER: LOAD TYPE:	SEALAND 228 2100 R -ROLL-OF	F 13	09:20 12 5:42 12/06/	2/05 989 0SS: TARE : NET :	71340 LB	一年の日本の「「日本の「「「」」「「「」」「「」」「「」」「「」」「「」」「「」」「「」」「」「」」「「」」「「」」「」」「「」」「」」「」」「」」「」」「」」「」」「」」「」」「」」「」」「」」「
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COMMENTS:						
1 No A	toin number			,	· · · · · · · · · · · · · · · · · · ·	
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sal Method:	D81/T45-D81	Dis	posal Method ((Other):		
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Vash Pad Release:	Signature	Rel	eased For Disp		Signature	

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LOAD TYPE: Rec Work Order Seq Number	FB -FLAT I Manifest Number	Profile Number	Federal EPA Waste Status	9,380 Benerator Name	Wste Clse
	00004760 5 3-01	J522860HM	CHK RESTRICTION	UNITED TECHNOLOGI	ES 52
		•	500"x	90"×49"	-
					- 19
COMMENTS:	G-64-16-11				
Approvals:		Date:	Time:		
CB Waste:	Sample		Techni	cian:	
Aix Ratio: / (Flue Dust) (D81/T45-D81 (Circle One)		sposal Method (Other): ensity:	anker Only)	
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TRUCK NUMBER	72A		04:36 12:13 12/1	12/11/67 11/89 TAR	E : 4360		The state of the s
LOAD TYPE:	R -ROLL-	OFF	· ·	NET	:18	820	
Rec Work Order	Manifest	Profile	Fadanal	EDA	Ganan	ator Name	Wste
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Mix Ratio: /(Flue Dust)	(Waste)	De	ensity:	π	anker Only)		
Nash Pad Release:		Re	eleased For Di			•	
Bulk Only)	Signature			- F F	Sian	sture-	

Profinition:	6 95 .7	RECEIP	TICKET	Number:	57290 <u>1</u>
DATE IN: SCHEDULED DATE:	12-11-89 12-11-89	7	7	TIME IN: SCHEDULED TIME:	<i>0</i> 1: 35
ISPORTER NAME TRUCK NUMBERS TRAILER NUMBERS	FREEHOLD 100 1001		01:38 12/11	ΓARE :	
LOAD TYPE:	R -ROLL-0)FF	11.23 12/11/07	21980	
Rec Work Order Seq Number	Manifest Number	Profile Number	Federal EPA Waste Status	Generator Name	Wste Clse
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Mix Ratio: (Flue Dust)	(Waste)	D	ensity:	(Tanker Only)	
Vash Pad Release:	Signature	R	eleased For Disposal	By: Signature	

$\label{eq:APPENDIX} \textbf{K}$ Copies of Disposal Certificates



Chemical Waste Management, Inc.

Emelle Facility P. O. Box 55 Emelle, Alabama 35459 205/652-9721

Pratt & Whitney (MS 122-16) 400 Main St. East Hartford, CT 06108

EPA ID NUMBER: ALD000622464

CERTIFICATE OF COMPLIANCE AND DISPOSAL

Chemical Waste Management, Inc., has received Waste material from Pratt & Whitney described on Alabama Hazardous Waste Manifest number CWMA 476051 Chemical Waste Management, Inc.,					: • <u>•</u>	
					<u>*</u> ; ₹	
					•	
here	by certifies that	Waste material rec	eived on	** ******		
the .	5th	day of _	December		_, 198 _9	was
disp	nsed of in comm	oliance with State an	nd Federal regulat	tions		

Glory McAboy, Document Control Supervisor February 16, 1990



Chemical Waste Management, Inc.

Emelie Facility P. O. Box 55 Emelie Alabama 35459 205/652-9721

Pratt & Whitney (MS 122-16) 400 Main St. East Hartford, CT 06108

EPA ID NUMBER: ALD000622464

CERTIFICATE OF COMPLIANCE AND DISPOSAL

Chemical Waste Management, Inc., has received Waste				·	
material from	Pratt & Whitney	· · · · · · · · · · · · · · · · · · ·	 		
described on Alabama Hazardous Waste Manifest number CWMA				<u>.</u>	
476052	Chemical Waste Management, Inc.,			· ·	
hereby certifies th	at Waste material rece	eived on			
the 5th	day of _	December	, 198 <u>9</u>	was	
disposed of in cor	mpliance with State an	d Federal regulations.			

Glory McAboy, Document Control Supervisor February 16, 1990



Chemical Waste Management, Inc.

Emelie Facility P. O. Box 55 Emelle, Alabama 35459 205/652-9721

Pratt & Whitney (MS 122-16) 400 Main St. East Hartford, CT 06108

EPA ID NUMBER: ALD000622464

CERTIFICATE OF COMPLIANCE AND DISPOSAL

Chemical Waste Ma	nagement, Inc., has	received Waste		• -
material from Pra	att & Whitney	·····		
described on Alabama Hazardous Waste Manifest number CWMA				1 ÷
476053	Chemical Was	te Management, Inc.,		
hereby certifies that	Waste material rece	eived on	•	
the 6th	day of	December	, 198 <u>9</u>	was
disposed of in comp	liance with State and	d Federal regulations.		

Glory McAboy, Document Control Supervisor

February 16, 1990



Chemical Waste Management, Inc. Emelle Facility

Emelle Facility
P. O. Box 55
Emelle, Alabama 35459
205/652-9721

Pratt & Whitney (MS 122-16) 400 Main St. East Hartford, CT 06108

EPA ID NUMBER: ALD000622464

CERTIFICATE OF COMPLIANCE AND DISPOSAL

Chemical Waste Ma	anagement, Inc., has	received Waste			·
material from Pra	att & Whitney				
described on Alaba	ma Hazardous Wast	e Manifest number CWMA	1		ž. • '#
476055	Chemical Was	ste Management, Inc.,		t	,
hereby certifies that	Waste material rece	eived on			
the	day of	December	, 198 <u></u>		_ was
disposed of in com	oliance with State an	d Federal regulations.			

Glory McAboy, Document Control Supervisor February 16, 1990



Chemical Waste Management, Inc.

Emelie Facility P. O. Bex 55 Emelie, Alabama 35459 205/652-9721

Pratt & Whitney (MS 122-12) 400 Main St. East Hartford, CT 06108

EPA ID NUMBER: ALD000622464

CERTIFICATE OF COMPLIANCE AND DISPOSAL

Che	mical Waste I	Management, Inc., has	s received Waste		-
mate	erial from	Pratt & Whitney		·	
desc	ribed on Alat	oama Hazardous Was	te Manifest number CW	MA .	
	476056	Chemical Wa	ste Management, Inc.,		
here	by certifies th	at Waste material rec	eived on		
the .	11th	day of _	December	, 198 <u>-9</u>	was
disn	osed of in co	moliance with State ar	nd Federal regulations.		

Glory McAboy, Document Control Supervisor February 16, 1990

Sampling Logs

APPENDIX L



DATE	1 7	0	7	89
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PROJE	CT I	10.		

PROJECT NAME Pratt + witney		
SAMPLE NO. J2191		-
SAMPLE LOCATION WFL A B	hend oil	
SAMPLE TYPE WATER	CONTAINERS USED	AMOUNT COLLECTED
COMPOSITEYES _X_NO		
COMPOSITE TYPE		
DEPTH OF SAMPLE		
WEATHER		
COMMENTS: Stated flushing at 11:57 sample collected at 12:01 had pass thru the line.	7 6 ofter	about 25 gallons
water looked clear.	•	



DATE	ı	2	0	7	8	9
TIME						
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PAGE						
PROJE	СТ	N).			

PROJECT NAME Pratt Whitney		
SAMPLE NO		
SAMPLE LOCATION WFL # 2 A	- WFL 4A	
SAMPLETYPEWATER	CONTAINERS	AMOUNT
COMPOSITEYES _X_NO	USED	COLLECTED
COMPOSITE TYPEN/A		
DEPTH OF SAMPLE		
WEATHER		
COMMENTS: started flushing a surple collected had flowed thru	t 12:07 at 12:15 lines.	after 25 gallons
WFC 4A collec	ted @ 12:18	(PUP)

PREPARED BY:



DATE /	20	7	89	
TIME	2	2	8	
PAGE	OF			
PAGE				
PROJECT NO.				

PROJECT NAME Prof + Whitzey		
SAMPLE NO J 2193		
SAMPLE LOCATION WFL 3 A		
SAMPLE TYPEWATER	CONTAINERS USED	AMOUNT COLLECTED
COMPOSITEYES _X_NO	***************************************	
COMPOSITE TYPE		
DEPTH OF SAMPLE		
WEATHER		
COMMENTS: started flushing e Surple collected at had possed thro line	12:20 12:28 after -	vzs gullous



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PROJECT NO.					

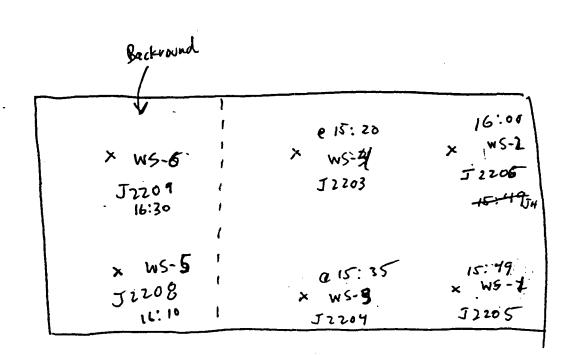
PROJECT NAME Pratt + Witney		
SAMPLE NO		
SAMPLE TYPE WATER	CONTAINERS USED	AMOUNT COLLECTED
COMPOSITE TYPE		
WEATHER Lold Chear	·	
comments: water was allowed prior to sampling.	to run for	5 min.



DATE /	2	0	7	89
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COMPOSITE YES X NO	S. 1.12	
SAMPLE TYPE WIPE OCCUMPOSITE YES X NO		
	CONTAINERS USED	AMOUNT COLLECTED
COMPOSITE TYPE	2- glass .	3 pads
DEPTH OF SAMPLE		

COMMENTS:



J2Z07 Field Blank C 15:40

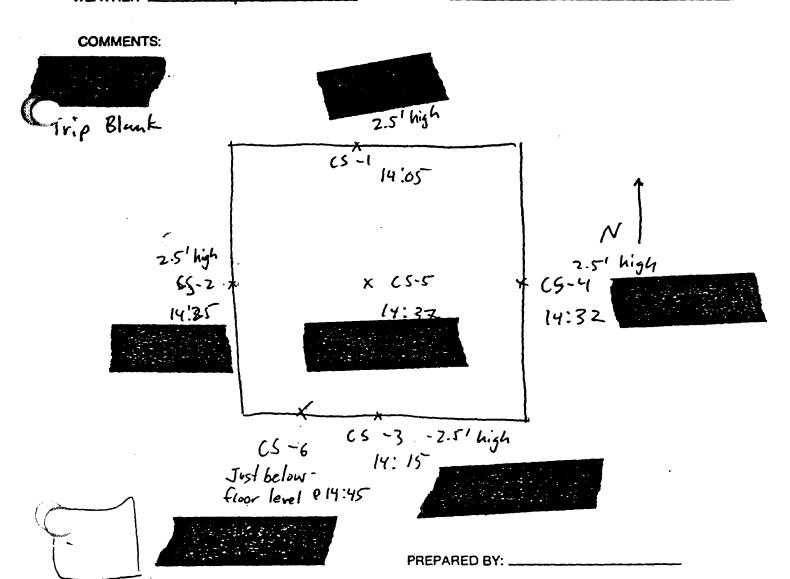
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PREPARED BY:



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PROJECT NO.								

PROJECT NAME Pratt + Whitney		
SAMPLE LOCATION Pit Area for air	scrubber.	
SAMPLETYPE Concrete chip	CONTAINERS USED	AMOUNT COLLECTED
COMPOSITE YES NO	902 glass	~10g.
DEPTH OF SAMPLE		
WEATHER CALD Clear		





CHAIN-OF-CUSTODY RECORD

	1 18	306
R/A Control No.	1	2062

C/C Control No. 161972

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
7140	Incluent A	12-7-84	WAILR			
2171	WFL-1 A					
172	WF1-2 A			*		
113	WFL-3 A		4	÷.		
2194	WFL-4 A		7 4		·	
7195	Travel Black	1	A 1	40 pl Vo Vial		
19.6	(5-1	12-1-89 14,05	Emeratechip	s 909 91955		
117	(3.7	12.794 14:25		١		
118	15-3	14.75				
.199	CS-41	14:32	4	4	_	
ial Instru	ctions:			·		
	pie Hazards:					
NATURE:	S: (Name, Company, Date and Jim	a)			30 ×	
-111-	ed By: Sy: Sy: Sy: Sy: Sy: Sy: Sy: Sy: Sy: S	17 12/7/89 e.	17:47	Jahard Den		
aiinquisn	ed By:	1	_ 3. Helinqu	isned By:		
		Λ .(Danahua	d hve		



CHAIN-OF-CO-CODY RECORD

R/A Control No. 1 307

C/C Control No. 161970

PROJECT NAME/NUMBER Profit Wheles	1 .			evil lab.	
SAMPLE TEAM MEMBERS Jacq 120 Hill	/I.I.	CARRIER	/WAYBILL NO	l	
	D-4	Committee	0	Candidan on Bassist	Discount

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
)7700	(5-5	12-7-89 14:37	clup	807 9455		
17701	(5-6	14.45	chip	902 5 1955		
7,202	Trop Blank for chaps		WATER	VOVIACS	_	
J1103	C. W 5-4	15:20.	WIPE !	But glass		
J2704	c ws-3	15:35	3 3"	j		
12205	c W 1 - 1	15:49.				
JZ 706	c W4-2	16,000	*			
17707	WIPE SAMPLE FILLBlunk	15:40				
72708	C W\$-5	16:10	,			
Jizog	c. W X -6	16:30	4	V		

Special Instructions:	
Possible Sample Hazards:	
SIGNATURES: (Name, Company, Date and Time) 1. Relinquished By: 12/1/85e 17:47 3. Relinquished By: Received by:	y:
•	y:

PROJECT NUMI PROJECT MANA BILL TO	BER	11 4 Whitney 1 singer 111 + Whitney		LAB DEST	IPLES SHIPPEI	C/C (12) 1/ T	Control No. 17 07 Control No. 161.78 17/89 Lev. 11 (-abs unie Palain
PURCHASE ORI	DER NO			PROJECT	CONTACT		entl Singer
Sample No.	Sample Type	Sample Volume	e Preservative Requested Testing Pro		Testing Program	Special Instructions	
J 2700	whip	807	N D		VO's, CN, Molal		
52201	chip	₹08			VO's, (,	N. Molals	
37202	WATER	2×4011			Aos	-	
72203	WIPE	3 pads	HNOZ Naotl	MOOH	VUS, C.	N, Molals	
J2204						1	
J2205							
J7206							
J1107							
J1208							
J2209	7	4	1		4 4	4	
TURNAROUND TIM	Normal .	ust be approved by the Proj	Rush (sh surcharge) d to contain high le	vels of hazardous substa	ances)
Nonhazard	Flamn	nable	Skin irritant	-	Highly Toxi	lc	Other(Please Specify)
SAMPLE DISPOSAL:	Return to Client	Disposal by Lab	will charge for packing, shipp	ping, and dispo	Date/Time		

WHITE - Original, to accompany samples YELLOW - Field copy

	BER	Frot1 +	Whitey Singer 1 Whiley 110.1 fied	REQUES:	LAB DI	LYSIS SAMPLES SHIPPED ESTINATION RATORY CONTACT LAB REPORT TO	R/A Cont C/C Cont 17 / 7 1 2011	rol No. 16 172
PURCHASE OR	DER NO.				PROJE	REPORT REQUIRED CONTACT PHONE NO	D	
Sample No.	Samı	ple Type	Sample Volume	Preserv	ative	Requested Testing F	Program	Special Instructions
J 2190	WAT	162		65 needed		Vos metals, (y	vari, Le	
37151	1					<u> </u>		
77142	11							
J7143				, 2		ÿ		
J7194				4		4		
37155	4		2x 40m	No		V 0's		
J 7196	concret	e cho	302	\ 0 ≥ 0		Vos metals	vanide	
J7157			1	1		1 7	7	
J2198								
J2199	4	5	7	1		7;	·	
TURNAROUND TIM		Normal .		Rush	• •	to rush surcharge)	žaroolis substances	
Nonhazard		Flamn	nable	Skin Irritant		Highly Toxic	-	Other(Please Specify)
SAMPLE DISPOSAL: FOR LAB USE ONL	Return to Cl	lent	Disposal by Lab By Adult W.	will charge for packing.	shipping, and	disposal.) Date/Time		(

WHITE - Original, to accompany samples YELLOW - Field copy

APPENDIX M

Raw Analytical Data

ÉNVIRONMENTAL LABORATORY INC

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, Ct. 06108

Date: December 15, 1989

SAMPLE DATA:

Collected By:

IT Corp.

Jacques Hill

SAMPLE NO.	DESCRIPTION OF SAMPLE
	Rinsate samples collected and received 12/7/89 from Pratt & Whitney, East Hartford, Ct., for hazardous waste incinerator closure plan analysis.
289-26-2673 289-26-2674	IT Sample No. J2193, WFL-3A

LABORATORY FINDINGS:

(milligrams per liter, mg/l, except as noted)

			SAMPLE NO.		
ANALYSIS FOR	289-26-2672	289-26-2673	289-26-2674	289-26-2675	289-26-2676
Arsenic Barium Cadmium Chromium, Total Chromium, Hexavalent Copper Lead Mercury Nickel Selenium Silver Cyanide, Total Cyanide, Amenable	∠ 0.01 ∠ 0.01 ∠ 0.01 ∠ 0.01 ∠ 0.01 ∠ 0.01 ∠ 0.02 ∠ 0.01 ∠ 0.01 ∠ 0.05	∠ 0.01 0.01	L 0.01 L 0.006 L 0.01 L 0.01 L 0.01 L 0.01 L 0.001 L 0.001 L 0.02 L 0.01 L 0.01 L 0.01 L 0.02 L 0.03 L 0	\(\) 0.01 \(\) 0.006 \(\) 0.01 \(\) 0.01 \(\) 0.09 \(\) 0.01 \(\) 0.001 \(\) 0.02 \(\) 0.01 \(\) 0.005	/ 0.01 / 0.006 / 0.01 / 0.01 / 0.09 / 0.01 / 0.02 / 0.01 / 0.01 0.21 0.18
				\cap /	0

cc: Pratt & Whitney
Attn: Scott Singer

Contin (/ Prest/)

ENVIRONMENTAL LABORATORY INC

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, Ct. 06108

Date: December 15, 1989

SAMPLE DATA:

Collected By:

IT Corp.

Jacques Hill

SAMPLE NO.	DESCRIPTION OF SAMPLE					
	Rinsate samples collected and received 12/7/89 from Pratt & Whitney East Hartford, Ct., for hazardous waste incinerator closure plan analysis.					
289-26-2673 289-26-2674 289-26-2675	IT Sample No. J2190, Influent A, analyzed 12/8/89. IT Sample No. J2191, WFL-1A, analyzed 12/10/89. IT Sample No. J2192, WFL-2A, analyzed 12/8/89. IT Sample No. J2193, WFL-3A, analyzed 12/10/89. IT Sample No. J2194, WFL-4A, analyzed 12/10/89.					

LABORATORY FINDINGS:

(parts per billion, ppb, except as noted)

	SAMPLE NO.				
ANALYSIS FOR	289-26-2672	289-26-2673	289-26-2674	289-26-2675	289-26-2676
Methylene chloride	ND	58 CB	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	12 CB	22	ND	16 CB
Carbon Tetrachloride	ND	ND	ND.	ND	ND
Trichloroethene	ND	122	ND	ND	ND
Tetrachloroethene	ND	48	3400	ND	3700
	ND 25 ppb	ND ∠5 ppb	ND Z10 ppb	ND 25 ppb	ND ∠10 ppb
	1				
			\bigcap		

CB - The results of the analysis have been corrected for the presence of the compound in the blank.

ENVIRONMENTAL LABORATORY INC

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, Ct. 06108

Date: December 15, 1989

SAMPLE DATA:

Collected By: IT Corp.

Jacques Hill

SAMPLE NO.	DESCRIPTION OF SAMPLE			
	Rinsate sample collected and received 12/7/89 from Pratt & Whitney, East Hartford, Ct., for hazardous waste incinerator closure plan analysis.			
289-26-2677	IT Sample No. J2195, Travel Blank, analyzed 12/8/89.			
	•			

LABORATORY FINDINGS:

(Parts per billion, except as noted)

ANALYSIS FOR	SAMPLE NO.			
ANALYSIS FOR	289-26-2677			
Methylene Chloride	ND			
1,1-Dichloroethene	ND			
1,1,1-Trichloroethane	ND			
Carbon Tetrachloride	ND			}
Trichloroethene	ND			
Tetrachloroethene	ND			
	ND L1 ppb	_		·
			1	
				h
			10/	

CB - The results of the analysis have been corrected for the presence of the compount

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, CT 06108

Date:

December 15, 1989

SAMPLE DATA:

Collected By: Jacques Hill, IT Corporation

SAMPLE NO.	DESCRIPTION OF SAMPLE				
289-26-2685 289-26-2686 289-26-2687	Wipe samples collected and received 12/7/89 from Pratt & Whitney, East Hartford, CT, for hazardous waste incinerator closure plan analysis. IT Sample No. J2203, CW-4 IT Sample No. J2204, CW-3 IT Sample No. J2205, CW-1 IT Sample No. J2206, CW-2 IT Sample No. J2207, Field Blank				

LABORATORY FINDINGS:

Results are in ug/wipe area

		SAMPLE NO.			
ANALYSIS FOR	289-26-2684	289-26-2685	289-26-2686	289-26-2687	289-26-2688
Arsenic Barium Cadmium Chromium, Total Copper Lead Mercury Nickel Selenium Silver Cyanide, Total	11 ALL 6.5 3.0 2.5 14 20.05 25.0 20.50 2.5 20.25	12 OVER RANGE 7.5 4.0 \angle 2.5 14 \angle 0.05 \angle 5.0 \angle 0.50 \angle 2.5 \angle 0.25	11 > 14.000 8.0 4.0 2.5 19 2 0.05 2 5.0 2 0.50 2 2.5 2 0.25	10 8.0 4.0 2.5 13 2 0.05 2 5.0 2 0.50 2 2.5 2 0.25	9.5 9.0 5.0 2.5 26 20.05 25.0 20.50 20.50 20.25

cc: Pratt & Whitney Att: Scott Singer

ENVIRONMENTAL LABORATORY INC

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, CT 06108

Date: Dece

December 15, 1989

SAMPLE DATA:

Collected By: Jacques Hill, IT Corporation

SAMPLE NO.	DESCRIPTION OF SAMPLE				
289-26-2685 289-26-2686 289-26-2687	Wipe samples collected and received 12/7/89 from Pratt & Whitney, East Hartford, Ct, for hazardous waste incinerator closure plan analysis. IT Sample #J-2203, CW-4 IT Sample #J-2204, CW-3 IT Sample #J-2205, CW-1 IT Sample #J-2206, CW-2 IT Sample #J-2207, Field Blank				

LABORATORY FINDINGS:

Results are in ug per Wipe Area

		SAMPLE NO.				
ANALYSIS FOR	289-26-2684	289-26-2685	289-26-2686	289-26-2687	289-26-2688	
Methylene Chloride 1,1-Dichloroethene 1,1,1-Trichloroethane Carbon Tetrachloride Trichloroethene Tetrachloroethene	ND ND 0.13 ND ND 0.40	ND ND 0.76 ND 0.005 0.96	ND ND 0.57 ND ND 0.29	ND 0.14 0.53 ND ND 0.55	0.49 ND 0.66 ND ND 0.21	
ND ∠0.05				0/		

cc: Pratt & Whitney
Att: Scott Singer

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ENVIRONMENTAL LABORATORY INC

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, CT 06108

Date: December 15, 1989

SAMPLE DATA:

Collected By: Jacques Hill, IT Corporation

SAMPLE NO.	DESCRIPTION OF SAMPLE
	Wipe samples collected and received 12/7/89 from Pratt & Whitney, East Hartford, Ct, for hazardous waste incinerator closure plan analysis. IT Sample No. J2208, CW-5 IT Sample No. J2209, CW-6

LABORATORY FINDINGS:

Results are in ug/wipe area

AVAI 9015 500	SAMPLE NO.			·	
ANALYSIS FOR	289-26-2689	289-26-2690			
Arsenic Barium Cadmium Chromium, Total Copper Lead Mercury Nickel Selenium Silver Cyanide, Total	9.5 ALL OVER RA 7.5 4.5 2.5 10 20.05 25.0 20.50 22.5 20.25	9.5 NGE; > 14, 8.0 3.5 2.5 11 20.05 20.50 20.50 20.25	000		

cc: Pratt & Whitney
Att: Scott Singer

/ (Man) S. (Max)

ENVIRONMENTAL LABORATORY INC

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, CT 06108

Date: December 18, 1989

SAMPLE DATA:

Collected By: Jacques Hill, IT Corp.

SAMPLE NO.	DESCRIPTION OF SAMPLE				
	Concrete chip samples collected and received 12-7-89 from Pratt & Whitney, East Hartford, CT for hazardous waste incinerator closure plan analysis.				
289-26-2679 289-26-2680	IT Sample No. J 2196, CS-1 IT Sample No. J 2197, CS-2 IT Sample No. J 2198, CS-3 IT Sample No. J 2199, CS-4 IT Sample No. J 2200, CS-5				

LABORATORY FINDINGS:

(milligrams per liter, mg/l, except as noted)

		SAMPLE NO.				
ANALYSIS FOR	289-26-2678	289-26-2689	289-26-2680	289-26-2681	289-26-2682	
pH, 10% Slurry Total Solids, percent	10.6 98.6	11.2 98.1	10.9 98.0	10.8 98.3	11.7 97.0	
Tests are mg/kg, (ppm), based on Dry Weight					_	
Arsenic	5.5	6.7	7.5	6.0	7.3	
Barium	47	23	40	5.0	45	
Cadmium	4.7	<u> </u>	∠1.5	<u></u>	∠1.5	
Chromium, Total	15	9.3	49	3.4	640	
Chromium, Hexavalent	∠ 0.059	0.065	0.23	0.13	0.033	
Copper	9.9	13	30	9.7	74	
Lead	L 2.1	L 2.1	3.0	L 2.1	9.8	
Mercury	0.043	0.042	0.049	0.042	0.049	
Nickel	19	8.9	54	4.2	400	
Selenium	L 0.47	∠ 0.45	∠ 0.47	\overline{L} 0.51	∠0.41	
Silver	L 2.2	Z 2.2	<u> </u>	\overline{L} 2.3	3.4	
Cyanide, Total	<u>L</u> 0.48	Z 0.49	$\overline{\angle}$ 0.48	\overline{L} 0.51	L 0.49	
^yanide, Amenable	_	-	-	_	-	
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			/),			

cc: Pratt & Whitney
Att: Scott Singer

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ENVIRONMENTAL LABORATORY INC

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, Ct. 06108

Date: December 15, 1989

SAMPLE DATA:

Collected By:

SAMPLE NO.	DESCRIPTION OF SAMPLE
	Concrete sample collected and received 12/7/89 from Pratt & Whitney, East Hartford, Ct., for hazardous waste incinerator closure plan analysis.
289-26-2678 289-26-2679 289-26-2680 289-26-2681 289-26-2682	IT Sample #CS-1 IT Sample #CS-2 IT Sample #CS-3 IT Sample #CS-4 IT Sample #CS-5
	DATE ANALYZED: 12/12/89

LABORATORY FINDINGS:

Parts per billion, ppb ND ∠2.5 ppb

		SAMPLE NO.				
ANALYSIS FOR	289-26-2678	289-26-2679	289-26-2680	289-26-2681	289-26-2682	
Methylene Chloride	5.4	7.4	1.8	4.7	8.8	
1,1-Dichloroethene	2.1	4.8	6.4	6.8	ND	
1,1,1-Trichloroethane	22	96	130	31	DM	
Carbon Tetrachloride	ND	ND	ND	ND	ND	
Trichloroethene	2.1	ND	ND	ND	ND	
Tetrachloroethene	280	460	530	310	17	
				\sim		

cc: Pratt & Whitney Attn: Scott Singer

The Averill Environmental Laborators to

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, Ct. 06108

Date: December 15, 1989

SAMPLE DATA:

Collected By:

IT Corp.

Jacques Hill

SAMPLE NO.	DESCRIPTION OF SAMPLE
٠	Concrete chip samples collected and received 12/7/89 from Pratt & Whitney, East Hartford, Ct., for hazardous waste incinerator closure plan analysis.
289-26-2679E 289-26-2680E 289-26-2681E	IT Sample No. J2196, CS-1 *EP Toxicity Elutriation IT Sample No. J2197, CS-2 *EP Toxicity Elutriation IT Sample No. J2198, CS-3 *EP Toxicity Elutriation IT Sample No. J2199, CS-4 *EP Toxicity Elutriation IT Sample No. J2200, CS-5 *EP Toxicity Elutriation

LABORATORY FINDINGS:

(milligrams per liter, mg/l, except as noted)

	SAMPLE NO.				
ANALYSIS FOR	289-26-2678	289-26-2679E	289-26-2680E	289-26-2681E	289-26-2682E
ml. 0.5N acetic acid	400	400	400	400	400
pH of filtrate	4.8	4.8	4.8	4.8	4.8
Tests are mg/l in filtrate					
Arsenic Barium Cadmium Chromium, Total Lead Mercury Selenium Silver	∠ 0.01 0.30 ∠ 0.03 0.06 ∠ 0.05 ∠ 0.001 ∠ 0.01 ∠ 0.05	∠ 0.01 0.16 ∠ 0.03 0.06 ∠ 0.05 ∠ 0.001 ∠ 0.01 ∠ 0.05	∠ 0.01 0.26 0.04 0.07 ∠ 0.05 ∠ 0.001 ∠ 0.01 ∠ 0.05	∠ 0.01 0.22 ∠ 0.03 0.06 ∠ 0.05 ∠ 0.001 ∠ 0.01 ∠ 0.05	∠ 0.01 0.31 ∠ 0.03 ∠ 0.05 ∠ 0.05 ∠ 0.001 ∠ 0.01 ∠ 0.05

*EP Toxicity Elutriation: 100 grams of sample mixed with the designated amount of 0.5N adetic acid, diluted to 2000 ml. with distilled water, mixed for 24 hours, settled and filtered through 0.45 mjcron filter paper. Filtrate was tested.

cc: Pratt & Whitney Attn: Scott Singer

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, CT 06108

Date:

December 18, 1989

SAMPLE DATA:

Collected By: Jacques Hill, IT Corp.

DESCRIPTION OF SAMPLE				
Concrete chip samples collected and received 12-7-89 from Pratt & Whitney, East Hartford, CT for hazardous waste incinerator closure plan analysis.				
IT Sample No. J 2201, CS-6				

LABORATORY FINDINGS:

(milligrams per liter, mg/l, except as noted)

ANAL VEIC 500	SAMPLE NO.				
ANALYSIS FOR	289-26-2683				
pH, 10% Slurry Total Solids, percent	11.1 99.1				
Tests are mg/kg, (ppm), based on Dry Weight					
Arsenic Barium	8.6 19				
Cadmium	<u> 15</u>		}		}
Chromium, Total	3.4				}
Chromium, Hexavalent	0.12				
Copper	10				
Lead Mercury	4.4 ∠ 0.049		{		
Nickel	L 4.9				
Selenium	7 0.49		Ì		
Silver	L 2.4				
Cyanide, Total	L 0.50			;	
Cyanide, Amenable	-				
	į				
		_	/ /		,

cc: Pratt & Whitney Att: Scott Singer

ENVIRONMENTAL LABORATORY INC

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, Ct. 06108

Dote: December 15, 1989

SAMPLE DATA:

Collected By:

SAMPLE NO.	DESCRIPTION OF SAMPLE		
	Concrete sample collected and received 12/7/89 from Pratt & Whitney, East Hartford, Ct., for hazardous waste incinerator closure plan analysis.		
289-26-2683	IT Sample #CS-6		
	DATE ANALYZED: 12/12/89		

LABORATORY FINDINGS:

parts per billion, ppb ND /_2.5 ppb

·····	110	.5 ppu			
ANALYSIS FOR		SAMPLE NO.			
ANALYSIS FOR	289-26-2683				
Methylene Chloride	5.2				
1,1-Dichloroethene	ND				
1,1,1-Trichloroethane	18				
Carbon Tetrachloride	ND				
Trichloroethene	ND				
Tetrachloroethene	300				
			}		
			()/)		

cc: Pratt & Whitney
Attn: Scott Singer

Xanter Heren

Lawton S. Averill, Director

CT Public Health Lab No. PH-0513

REPORT ON LABORATORY EXAMINATIONS

To Client:

Pratt & Whitney

East Hartford, Ct. 06108

Date: December 15, 1989

SAMPLE DATA:

Collected By:

IT Corp.

Jacques Hill

SAMPLE NO.	DESCRIPTION OF SAMPLE				
	Concrete chip sample collected and received 12/7/89 from Pratt & Whitney, East Hartford, Ct. for hazardous waste incinerator closure plan analysis.				
289-26-2683 (E)	IT Sample No. J2201, CS-6 *EP Toxicity Elutriation				

LABORATORY FINDINGS:

(milligrams per liter, mg/l, except as noted)

Vere 500	SAMPLE NO.				
ANALYSIS FOR	289-26-2683E				
ml. O.5N acetic acid	400				
pH of filtrate	4.8				
Tests are mg/l in filtrat	<u>:e</u>				
Arsenic	∠ 0.01	·			
Barium Cadui	0.21				
Cadmium Chromium, total	\(\(\text{0.03} \\ 0.05 \\ \)				
Lead	/ 0.05				
Mercury	7 0.001				
Selenium	Z 0.01				
Silver	\ \(\alpha \ 0.05 \)				
*EP Toxicity Elutriation:		mixed with the designa			

acetic acid, diluted to 2000 ml, with distilled water, mixed for 24 hours, settled, and filtered through 0.45 micron filter Filtrate was tested. paper.

cc: Pratt & Whitney

Attn: Scott Singer

APPENDIX N Validation Report

QA/QC REVIEW OF AVERILL ENVIRONMENTAL LABORATORY DATA FOR WASTE FEED LINE RESULTS (ROUND II)

METALS

- Holding Times: Samples were prepared and analyzed within 40 CFR 136 holding times.
- Initial and Continuing Calibration Verification: Arsenic (82%) had a percent recovery outside control limits (90-110%). Arsenic results should be considered estimates.
- Blanks: Calibration and preparation blanks contained traces of chromium (0.01 mg/L), copper (0.003 mg/L), lead (0.02 mg/L) and zinc (0.003 mg/L). Results for these metals less than five times the blank level should not be reported.
- <u>Duplciates</u>: All duplicate analyses were within control limits.
- Spike Sample Recovery: All percent recoveries were within control limits.

VOLATILES BY 8010

- Holding Times: Samples were analyzed within 40 CFR 136 holding times.
- <u>Initial Calibration</u>: All percent relative standard deviation (% RSD's) were within control limits (less than 20%).
- Continuing Calibration: All percent differences (% D's) were within control limits (less than 15%).
- Blanks: The trip blank (travel blank) reported all target compounds as non-detected. Method blanks Run #800 (4.7 μg/L) and Run #808 (0.51 μg/L) contained 1,1,1-trichloroethane. No results less than five times the blank level should be reported in associated samples.
- <u>Surrogate Recoveries</u>: Percent recoveries were within control limits established by Method 8010, SW-846.
- <u>Matrix Spike and Duplicate</u>: Relative percent differences and percent recoveries were all within control limits.

QA/QC REVIEW OF AVERILL ENVIRONMENTAL LABORATORY DATA FOR CEILING WIPE SAMPLE RESULTS

METALS

- Holding Times: All samples were prepared and anlayzed within the required holding times.
- <u>Initial and Continuing Calibration Verification</u>: Arsenic (82%) had a percent recovery outside control limits. Results for arsenic should be considered estimates.
- Blanks: Calibration and preparation blanks contained traces of chromium (0.01 mg/L), copper (0.003 mg/L), lead (0.02 mg/L), and zinc (0.003 mg/L). The field blank contained traces of arsenic (9.5 μg/100 cm²). The filter blank contained traces of cadmium (3.5 μg/100 cm²), lead (10 μg/100 cm²), and arsenic (9.2 μg/100 cm²). Results for chromium (25 μg/100 cm²), arsenic (47.5 μg/100 cm²), cadmium (45 μg/100 cm²), and lead (130 μg/100 cm²), below these levels, should be rejected. Also, all results for barium should be rejected.

VOLATILES BY 8010

- Holding Times: All samples were analyzed within the required holding times.
- <u>Initial Calibration</u>: All percent relative standard deviations (% RSD's) were within control limits (less than 20%).
- Continuing Calibration: 1,1,1-Trichloroethane (12/12/89--day sample), methylene chloride (12/12/89--night sample), and 1,1,1-trichloroethane (12/13/89--day sample) each had percent differences greater than 15%. Results for these compounds in associated samples should be considered estimates.
- Blanks: The field blank contained traces of methylene chloride (0.49 μg/100 cm²), 1,1,1-trichloroethane (0.66 μg/100 cm²), and tetrachloroethene (0.21 μg/100 cm²). The wipe blanks reported all target compounds as non-detect. Results for methylene chloride (4.9 μg/100 cm²), 1,1,1-trichloroethane (3.3 μg/100 cm²), and tetrachloroethene (1.05 μg/100 cm²), below these levels, should be rejected.
- <u>Surrogate Recoveries</u>: Samples CW-4 and CW-5 had one of three percent recoveries outside control limits. No action will be taken for just one out.
- <u>Matrix Spike and Duplicate</u>: All percent recoveries were within control limits.

 Two out of six relative percent differences were outside control limits. No action is taken.

QA/QC REVIEW OF AVERILL ENVIRONMENTAL LABORATORY DATA FOR CONCRETE CHIP SAMPLE RESULTS

METALS

- Holding Times: Samples were analyzed and prepared within appropriate holding times.
- <u>Initial and Continuing Calibration Verification</u>: Arsenic (82%) had a percent recovery outside control limits. Arsenic results should be considered estimates.
- Blanks: The lab blank and method blank reported all target compounds as non-detect. Calibration and preparation blanks contained traces of chromium (0.01 mg/L), copper (0.003 mg/L), lead (0.02 mg/L) and zinc (0.003 mg/L). Results less than five times the blank level should not be reported in associated samples.
- <u>Duplicates</u>: Chromium (39%) for total metal anlayses had a relative percent deviation (RPD) outside control limits (0-35%). Results for chromium in total metals analyses should be considered estimates.
- Spike Sample Recovery: No spike samples were analyzed.

VOLATILES BY 8010

- Holding Times: Samples were analyzed within the appropriate holding times.
- <u>Initial Calibration</u>: All percent relative standard deviations (% RSD's) were within control limits (less than 20%).
- Continuing Calibration: All percent differences (% D's) were within control limits (less than 15%).
- Blank: The method blank reported all target compounds as non-detected.
- <u>Surrogate Recoveries</u>: IT sample numbers CS-1 and CS-4 had one of three surrogate recoveries outside control limits. No action will be taken on one of three surrogates outside control limits.
- <u>Matrix Spike and Duplicate</u>: One of three percent recoveries and one of six relative percent differences were outside control limits. This data in conjunction with surrogate data, indicate a matrix interference, but is not critical in higher concentrations of analyte.

RCRA Part B Permit Application United Technologies Pratt & Whitney CTD 990672081

Page 146 of 149 September 5, 1991

APPENDIX H-3 CLOSURE PLAN FOR THE WAX/SOLVENT STORAGE TANK

RCRA CLOSURE PLAN FOR WAX/SOLVENT STORAGE TANK

RESOURCE CONSERVATION AND RECOVERY ACT CONCENTRATED WASTE TREATMENT PLANT

November, 1990 Revised September 5, 1991

Prepared for:

United Technologies Corporation Pratt & Whitney 400 Main Street East Hartford, Connecticut EPA ID # CTD990672081

Prepared by: Loureiro Engineering Associates 100 Northwest Drive Plainville, CT 06062

Comm. No. 971-10 971-25

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ACRONYMS

CTDEP: Connecticut Department of Environmental Protection

CWTP: Concentrated Waste Treatment Plant

EPA: U.S. Environmental Protection Agency

MCL: Maximum Containment Level

P&W: Pratt & Whitney

QA/QC: Quality Analysis/Quality Control

RCRA: Resource Conservation and Recovery Act

TCLP: Toxicity Characteristic Leaching Procedure

TSDF: Treatment Storage Disposal Facility

A. INTRODUCTION

This Closure Plan is provided for the wax/solvent storage tank located at the Concentrated Waste Treatment Plant of United Technologies - Pratt & Whitney East Hartford facility, EPA ID NO. CTD990672081. Closure of this unit will be conducted in accordance with all applicable RCRA regulations, and will:

- 1) Minimize the need for further maintenance, and;
- 2) Control, minimize or eliminate to the extent necessary to protect human health and the environment, the post closure escape of hazardous waste, hazardous constituents, leachate, or contaminated run-off to the groundwater, surface water or the atmosphere.

In subsequent sections, this closure plan provides a description of methods to be applied and precautions to be taken in closing the wax/solvent tank. Specific closure activities are described in detail and a trackable closure schedule and cost estimate are provided.

Upon completion of closure, P&W will submit a certification by both P&W and an independent registered professional engineer to the Regional Administrator and the DEP Commissioner that the facility has been closed in accordance with the specifications in the approved closure plan. The closure certification will include all other pertinent analytical data as well as the following:

- Photographic records of the closure documenting each construction step of the closure process
- ° Contractors daily log

A list of any departure from the approved plan with rationales in accordance with 40 CFR 264.112(c).

In subsequent sections, this Closure Plan provides a detailed description of specific procedures to be followed and precautions to be taken in closing the wax/solvent storage tank.

B. FACILITY DESCRIPTION

P&W East Hartford generates a variety of hazardous wastes and receives wastes from P&W satellite plants located in Connecticut, Maine and New York. Currently these wastes are managed in eleven (11) storage tanks (8 above ground and 3 underground) and five (5) container storage areas all located within an area known as the Concentrated Waste Treatment Plant (CWTP). These operations are located in an area near the northern end of the East Hartford plant complex.

Pratt & Whitney is planning to upgrade these facilities. Design work is in progress and construction is planned for 1991. Waste generated on-site are also managed at other locations within the facility in containers and tanks for less than ninety (90) days.

The wax/solvent tank was once used for hazardous waste accumulation and storage and had the capability to feed directly to an incinerator. The incinerator has been removed and the wax/solvent tank has become obsolete and will therefore be closed

C. WAX/SOLVENT TANK DESCRIPTION

The wax/solvent storage tank is located in the CWTP, in the same building as the former Burn-Zol incinerator, which is also presently being closed under a closure plan approved by the CIDEP and EPA. The tank was used to store wax/solvent sludges which accumulated at the bottom of a solvents, 1,1,1-trichloroethane still where used such as perchloroethylene, were distilled for reuse. The tank was used only for storage of the wax/solvent mixture. It was heated to avoid precipitation of the wax from the mixture. The tank had a closed top to minimize solvent evaporation and an air duct to vent the tank. The tank was located in a pit, which served as a secondary containment.

An above ground wax/solvent feed line used to connect the wax/solvent tank directly to the incinerator located in the same building. The wax/solvent feed line leading to the incinerator was actually used on four separate occasions, each involving trial test burns of the wax/solvent waste stream in the incinerator. These tests were performed on 3-31-82, 12-14-82, 12-13-83, and 5-30-84. Each of these tests indicated deficiencies related to the operation of the incinerator and inadequate scrubber performance. A decision was made in the first quarter of 1985 to postpone plans for additional trial burns, and subsequently, to abandon the incinerator permitting process and consider closure alternatives. As

already mentioned previously, the incinerator components, and wax/solvent feed line attached to the incinerator, have been removed and the incinerator area is being closed as part of a CTDEP and EPA approved closure plan.

D. GENERAL CLOSURE REQUIREMENTS

a. General

This section presents the general closure requirements pertaining to closure of the wax/solvent storage tank. A detailed description of the specific activities to be followed during closure is given in the following section (Section E). It is expected that at the time of closure, the tank will contain insignificant amounts of hazardous waste. Closure will be completed within 180 days of the starting date.

Closure activities will involve removal of any hazardous waste remaining in the tank; dismantling and disposal of tank and ancillary equipment; decontamination of the containment pit; confirmatory sampling and analysis; and data evaluation and closure certification by a licensed professional engineer. Specific procedures for sample analysis and data evaluation are provided in Section F of this plan while a closure cost estimate is presented in Section G.

b. Closure Requirements

1. Health and Safety - The decontamination crew will consist of a minimum of two individuals who will be adequately clothed, including self-contained breathing apparatus, if required, and coveralls. Supervision of the decontamination process will include the individual(s) responsible for operation of the TSDF.

The primary basis for the level of personnel protection selected is determined by:

The type, toxicity, measured concentration, and permissible exposure limits of the chemical substances.

The potential or measured exposure to substances in the air, splashes of liquids, or other direct contact with materials due to the work being performed.

The personnel protective equipment used to protect the body against chemical hazards is divided into four categories according to the degree of protection:

- Level A Will be worn when the highest level of respiratory, skin, and eye protection is needed.
- Level B Will be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is needed.
- Level C Will be worn when the types of airborne substances are known, the concentrations have been measured, and the criteria for using air-purifying respirators are met.
- Level D This level is used where no respiratory or skin hazards are present. Level D protection is primarily a work uniform providing minimal protection

It is not anticipated that personnel will need to use Levels A or B.

2. Sudden or Non-Sudden Release, or Fire Hazard - The decontamination process will be considered as an activity presenting a high risk potential for release of hazardous waste or fire/explosion hazard. As such, the appropriate mechanisms of the Contingency Plan will be ready for activation.

3. <u>Timetable</u> - Completion of closure will be within 180 days of agency approval of the closure plan. The schedule for closure including milestone dates follows:

DAY	ACTIVITY
0	EPA and CTDEP approved closure plan.
90	All hazardous wastes disposed of off-site at permitted facilities. Tank and appurtenances removed and disposed of off-site at permitted facilities.
100	Inspection for residual wastes completed and all damaged areas identified. Samples collected from damaged areas and analyzed appropriately.
120	Floors and equipment cleaned and rinsed. Confirmatory chip samples taken of the concrete containments.
150	Floor and piping repaired and/or sealed as necessary for further use.
180	Completion of closure.

All final closure activities will be supervised and certified by an independent registered professional engineer, in addition to P&W personnel.

P&W may require an extension for closure time depending on the season that closure begins.

4. Certification - The following certification should be submitted to
the EPA Region I Administrator and the Commissioner of CT DEP upon
completion of closure:
"I,, for Pratt & Whitney, United Technologies (Name)
Corporation, owner and operator of, (Site)
a hazardous waste storage area and I,, P.E., (Name)
employed by, certify by means of our (Firm)
signatures, that the facility named above has been closed in accordance
with the method specified by the Closure Plan, and attached hereto.
Closure was completed on, after receiving the final (Date)
volume of material on".

E. DESCRIPTION OF CLOSURE ACTIVITIES

This section describes in detail the specific procedures to be applied and precautions to be taken in closing the wax/solvent storage tank. The hazardous waste inventory expected to be present in the tank at the time of closure is minimal, limited to wax residues on the side of the tank.

The wax/solvent tank closure process concerns only the tank, associated waste feed or vent lines, and the containment pit and immediate adjacent area potentially contacted by tank operations. The following detailed procedures describe the work.

- A Health and Safety Plan, specific to the wax/solvent storage tank will be prepared to cover the closure activities to be performed.
- 2. Any wax residues remaining on the sides, top and bottom of the tank, on the tank components, and on the containment pit will be removed to the maximum extent possible, by brushing, cleaning and scraping. The resulting accumulation of waste residue along with any contaminated disposable clothing will be drummed and treated as hazardous waste. Any tools used during residue removal will be decontaminated using an industrial grade non-phosphate detergent and water solution with a plant tap water rinse. All rinsate will be collected and treated as a hazardous waste liquid at the CWTP.

- Once all hazardous waste inventory has been removed (to the 3. extent possible), the tank, tank accessories and above ground air ducts and piping will be dismantled and disposed of as hazardous licensed waste hauler to a permitted TSDF. waste via а Disassembly will consist of manual dismantling and/or the use of powered equipment. Both hot or cold cutting techniques may be The size of stockpiled components will be directly disposal facilities influenced by the requirements It is anticipated that all piping will be cut into landfilling. four foot sections and that larger components will not exceed 10 feet in any dimension.
- 4. After removal of the tank components, the concrete pit which used to serve as a secondary containment for the tank will be shotblasted or scarified. The potential for fugitive dust emissions will be minimized by utilizing equipment which immediately contains all generated residue. This residue will be collected, stored and treated as hazardous waste.
- 5. The containment area will subsequently be scrubbed with either a solution containing 5 percent sodium carbonate and 5 percent trisodium phosphate or simply a 5 percent solution of trisodium phosphate. The area will then be thoroughly rinsed with water. (The plant tap water will also be analyzed for the CSP list). Spent decontamination solutions or rinsewaters will be collected in existing sumps or will be contained through the use of dikes

to prevent wash water migrating into clean areas. This rinsate will be collected using a wet/dry vacuum then stored and treated as a hazardous waste.

- in closure activities will either be 6. All equipment used decontaminated or collected and disposed of as hazardous waste. An equipment decontamination zone will be located within the Contaminant Reduction Zone (as outlined by the Health & Safety Plan) and will include a high pressure wash area for equipment vehicles, as needed. Respirators, if used, will be and daily by setting the cartridges decontaminated disassembling the masks, placing all parts in a cleansing solution and rinsing them with tap water. Old cartridges, as personal protective well discarded qear from decontamination of the tank storage areas will be collected and disposed of off-site as hazardous waste. Small manual tools and equipment used during decontamination, such as brushes, gloves, disposable suits, etc., will be collected in a 55-gallon drum and disposed of as hazardous waste using licensed transporters and Portions of larger tools (i.e. permitted disposal facilities. lifts, hoists) which have come in contact with the waste will be decontaminated by steam cleaning. All rinsate generated during decontamination activities will be collected and treated as hazardous waste.
- 7. Once decontamination has been completed as described above, the wax/solvent storage area will be inspected for cracks or other

visible sians of deterioration. If cracks or signs of deterioration are observed then the sampling plan presented below will be modified to include a representative portion of these areas. If sampling of cracks, gaps or damaged and deteriorated in the concrete indicate that hazardous constituents may slab, then additional migrated below the concrete partial removal of the contaminated decontamination and/or surface will be performed. Additional confirmatory sampling will be performed in these areas. In the unlikely situation that the subgrade underneath the slab is found to be contaminated then the Closure Plan would be modified to include specific clean-up measures for these areas.

8. If no cracks, or visible signs of deterioration are found, then non-statistical "judgement sampling" of potentially contaminated areas based on visual observations, is not possible. Instead, verification sampling will be performed according to the following procedure:

The containment area after decontamination will be gridded and sampled at locations corresponding to randomly selected grid nodes. The area to be gridded includes the floor of the containment pit, which will represent worst case conditions, and the area immediately adjacent to the tank pit inside the building, that could potentially have been affected by the tank operations (Refer to Figure 1). The size of the grid interval is

determined by this generally accepted mathematical formula:

$$GI = (A/3.14)^{0.5}/2$$
, where:

GI = grid interval, ft

A = area to be gridded, sq. ft.

The calculated value for the grid interval is then rounded off to the nearest integer and the area is gridded.

The number of samples (n) to be obtained from each slab is determined by the square root of the number of grid nodes.

A random number table or generator is typically used to determine which grid nodes or grid areas will be sampled.

Table 1 outlines the calculations of the number of verification samples required to be collected from the wax/solvent storage tank area to generate statistically viable data.

The number of grid samples shown in Table 1 is the number of samples statistically required. A random number table procedure was used to calculate the exact location of these samples, which are shown in Figure 1. In addition to these samples, a representative number of samples will be collected from obviously contaminated spots, cracks or other areas that show signs of severe deterioration. These samples, if any, will be in addition to those shown in Figure 1.

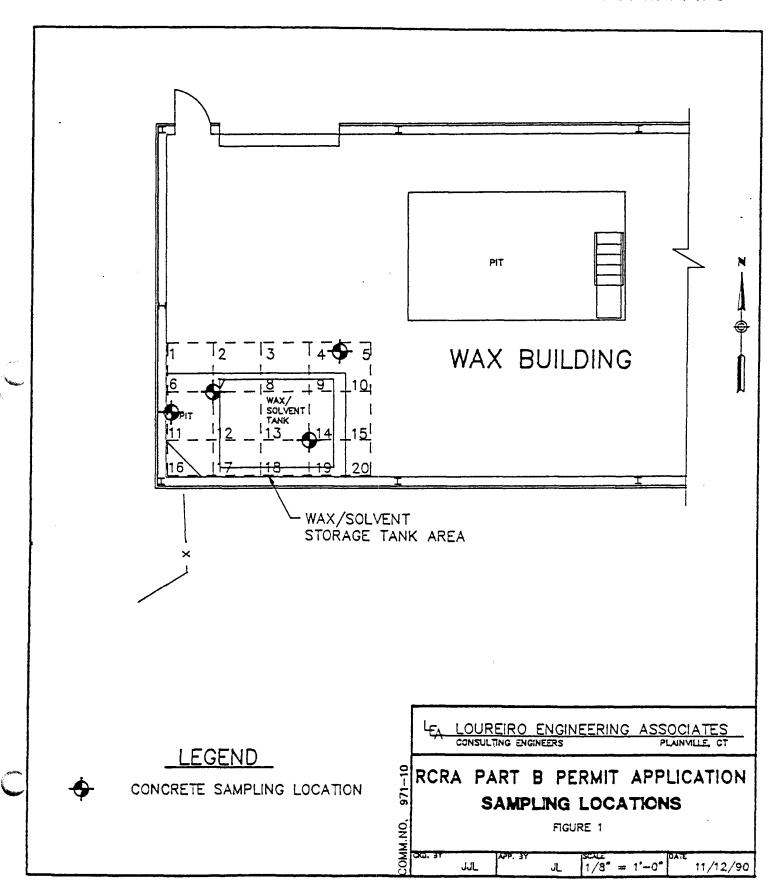
All samples will consist of concrete chip samples collected with an air chisel or similar tool. The portion of the tool in direct contact with the concrete will be cleaned between samples using an industrial non-phosphate detergent wash and a tap water rinse.

TABLE 1 WAX/SOLVENT STORAGE TANK VERIFICATION SAMPLING

Process	Area (Sq. Ft)	Grid Interval	No. of Grid Nodes	No. of Grid Samples	No. of Non- Statistical Samples	Total No. of Samples
Wax/Solvent Storage Tank	240	4	20	4	*	4 or more

^{*} Refers to samples to be collected from suspected hot spots or areas showing visible signs of deterioration, staining, discoloration or cracks in the concrete, as determined in Step No. 7 of the closure activities.

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The resulting concrete chips will be transferred directly into laboratory supplied glassware. The field QA/QC program for concrete chip samples will consist of one field duplicate and one trip blank to accompany the samples to the laboratory. Immediately following sample collection each sample will be labeled and placed in an iced cooler. The samples will be transported under full chain-of-custody to a State of Connecticut approved laboratory.

The analytical testing and determination procedures are presented in Section C of the Closure Plan.

If based on an evaluation of the analytical data (comparison to available background levels and to health/risk based levels) the decontamination effects deemed incomplete, are will decontamination be repeated until follow-up sampling demonstrates that parameters are at or below health/risk standards or are consistent with background levels. Any concrete chip sampling areas which exhibit levels consistent with background and either above or below health/risk levels will be representative of ambient background levels thus decontamination efforts will be deemed complete.

9. The certification of closure will be completed as discussed in Section B(b)(4) of this Closure Plan. Within 60 days of completion of all closure activities, the Certification of Closure will be sent by registered mail to the EPA Regional Administrator and the Commissioner of the Connecticut Department of Environmental Protection.

F. ANALYSIS AND DATA EVALUATION

This section presents the analytical methods and QA/QC procedures to be followed during sample analysis. Data evaluation will be based on a comparison of the data collected with background levels and/or health/risk based standards.

a. Analytical Parameters

A specific analytical parameter list has been developed for concrete chip samples collected during closure of the wax/solvent storage tank. The list, presented in Table 2, is representative of all listed hazardous waste constituents present in the wax/solvent mixture, the only waste stream stored in the wax/solvent storage tank. In addition to the constituents listed in Table 2, the characteristics hazardous waste parameters of corrosivity and TCIP (metals only) have been deemed applicable and are therefore included. The aforementioned parameters were taken from the approved closure plan for the incinerator as both units handled the same waste stream with the exception of cyanide wastes which were not placed in the wax/solvent tank.

The analytical methods presented in Table 2 have been selected from the third edition of <u>EPA's Publication SW-846 - "Test Methods for Evaluating Solid Waste".</u> The designated laboratory will follow all applicable internal QA/QC procedures outlined in SW-846.

TABLE 2 SPECIFIC LIST OF ANALYTICAL PARAMETERS

Analytical Parameters	Solid Mass Analysis (Concrete Chip Samples)
<u>Metals</u>	
Arsenic	3050/7060
Barium	3050/6010
Cadmium	3050/6010
Chromium (Total)	3050/6010
Chromium VI	 /7196
Copper	3050/6010
Lead	3050/6010
Mercury	3050/7471
Nickel	3050/6010
Selenium	3050/7740
Silver	3050/6010
Volatile Organic Compounds	
Carbon Tetrachloride	5030/8010
1,1,-Dichloroethylene	5030/8010
Methylene Chloride	5030/8010
Tetrachloroethylene	5030/8010
1,1,1-Trichloroethane	5030/8010
Trichloroethylene	5030/8010

<u>Notation</u>

^{*5030/8010 -} preparation method/analytical method

b. Data Validation

Upon receipt of the analytical data, an initial evaluation of the results will be performed through data validation. Data validation includes a review of field QA/QC procedures (i.e. trip blanks, field duplicates) and laboratory QA/QC procedures (i.e. holding times, blind duplicate analysis, surrogate recoveries). Data points that are not adequately supported by the QA/QC procedures will be referred to the sampling team and/or the laboratory for appropriate corrective actions.

Upon completion of data validation, the results will be compared to background data points and the relevant and appropriate regulatory standards and criteria. An explanation of how this will be performed for each sample media (aqueous or solid) is presented below.

c. Data Evaluation

As previously stated, decontamination of the wax/solvent storage tank will be demonstrated complete by concrete chip sampling and comparison to regulatory and/or background levels.

Analytical data will be generated for the concrete on a mass analysis basis for all the parameters listed in Table 2. The hazardous waste characteristic of toxicity will be determined by performing the TCLP test for selected metals (arsenic, barium, cadmium, chromium (T), lead, mercury, selenium, silver).

The background levels to be used in data evaluation will be identical to the ones established recently during closure of the Burn-Zol incinerator. The incinerator was located in the same building as the wax/solvent storage tank and valid background data has already been generated.

Analytical results on concrete chip samples for TCLP metals will be compared to the regulatory levels specified in 40 CFR 261.3. If any parameter exceeds the applicable regulatory level then decontamination will be deemed incomplete in the area of that sample. If this circumstance occurs for any of the concrete chip samples collected, decontamination efforts will continue until follow-up sample data achieves the applicable target standard.

In addition to the evaluation on the basis of TCLP (characteristic of toxicity), data evaluation against health/risk based standards will be performed for the contaminants detected. This evaluation will only be performed for parameters that have health/risk based standards associated with them as listed in EPA's publication "RCRA Facility Investigation Guidance", interim final (EPA 530/SW-89-31), dated May, 1989.

Table 3 summarizes the health/risk based standards for the parameters of concern, according to which the concrete chip samples will be evaluated. Evaluation will consist of comparing identified constituent levels to available background data and to health/risk based standards. Decontamination efforts will be deemed incomplete if

TABLE 3 HEALTH/RISK - BASED STANDARDS CONCRETE CHIP SAMPLING

CONSTITUENT	CONCENTRATION (mg/kg)
Arsenic	0.02
Barium	900
Cadmium	*
Chromium (VI)	90
Copper	*
Lead	*
Mercury	*
Nickel	300
Selenium	*
Silver	50
Carbon Tetrachloride	5.4
1,1-Dichloroethylene	12
Methylene Chloride	93
Tetrachloroethylene	140
1,1,1-Trichloroethane	7000
Trichloroethylene	64

Risk levels obtained from RCRA Facility Investigation (RFI) Guidance Document (EPA Publication 530/SW-89-031).

*No risk levels identified

levels exceed health/risk based standards with the constituent exception of samples that demonstrate such levels but are consistent with ambient background levels. Decontamination efforts must continue until followup sampling demonstrates that parameters are at or below health/risk based standards or are consistent with background levels. Any concrete chip sampling areas which exhibit levels consistent with background and either above or below health/risk based levels will be considered representative of ambient background levels thus decontamination efforts will be deemed complete.

D. CLOSURE COST ESTIMATE

The closure cost estimate for the wax/solvent storage area is estimated to be \$83,000 in 1990 dollars. A breakdown of the costs is included in Table 4. All costs assume performance of closure activity by a qualified third-party contractor. The estimates assume that no appreciable waste will be present in the tank at closure.

TABLE 4 CLOSURE COST ESTIMATE

	ACTIVITY			COST
1.	Health & Safety Plan		\$	3,000
2.	Removal of Hazardous Waste Inve 100 mh x \$40/hr: Disposal of scrapings:	entory	\$	4,000 2,500
3.	Dismantling and Disposal of Tar and Ancillary Equipment	ık	\$	20,000
4.	Decontamination of Containment 160 mh x \$40/hr: Disposal:	Pit		6,400 18,000
5.	Verification Sampling and Analy 32 mh x \$60/hr: 6 samples x \$1,200 ea:	ysis	\$	1,920 7,200
6.	Data Evaluation and Closure Cer 120 mh x \$40/hr:	ctification	\$	5,000
		Subtotal Insurance (7%) Contingency (15%)	Ś	668,020 64,780 610,200
		TOTAL	Ś	83,000

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APPENDIX H - 4

CLOSURE PLAN OF
CWIP-1 THROUGH CWIP-4
(THREE CONTAINER STORAGE AREAS
AND TWO TANK STORAGE AREAS)

RCRA CLOSURE PLAN OF CWIP-1 THROUGH CWIP-4 and CWIP-6 (THREE CONTAINER STORAGE AREAS AND TWO TANK STORAGE AREAS)

RESOURCE CONSERVATION AND RECOVERY ACT CONCENTRATED WASTE TREATMENT PLANT EAST HARTFORD, CONNECTICUT

December, 1990

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Prepared for:

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ACRONYMS

CSP: Clean Standard Parameter

CTAL: Connecticut Action Level

CIDEP: Connecticut Department of Environmental Protection

CWTP: Concentrated Waste Treatment Plant

EPA: U.S. Environmental Protection Agency

MCL: Maximum Contaminant Level

P&W: Pratt & Whitney

QA/QC: Quality Analysis/Quality Control

RCRA: Resource Conservation and Recovery Act

RfD: Reference Dose

RSD: Risk Specific Dose

A. INTRODUCTION

This Closure Plan is provided in accordance with RCRA Regulations for five of the active units at the Concentrated Waste Treatment Plant (CWTP), these units include the following six storage areas:

(1)	Treatment Building, Container Storage Area	(CWTP-1)
(2)	Barrel Building, Container Storage Area	(CWIP-2)
(3)	Barrel Transporter Storage Pad	(CWTP-4)
(4)	Storage Building, Container Storage Area	(CWIP-6)
(5)	Barrel Building, Tank Storage Area	(CWTP-2)
(6)	Underground Oil Tanks	(CWTP-3)

Three of these units are container storage areas, while the other two are tank storage areas. All of the tanks have secondary containment, although some of the ancillary piping does not. Storage building CWIP-5 has never been used for storage of hazardous waste and therefore it will not undergo closure.

Closure of these facilities will be performed in a manner that:

- 1. Minimizes the need for further maintenance, and;
- Controls, minimizes or eliminates to the extent necessary, postclosure release of hazardous wastes to groundwater, surface water or the atmosphere.

A copy of the closure plan will be maintained on-site at the East Hartford Facility until the certification of closure has been submitted to and accepted by the U.S. Environmental Protection Agency (EPA) Region I and the Connecticut Department of Environmental Protection (CTDEP). P&W will notify the EPA Regional Administrator and CTDEP Commissioner at least 45 days prior to the date final closure is expected to begin. Upon completion of closure of each

area, P&W will submit a certification by both P&W and an independent registered professional engineer to the Regional Administrator and the CTDEP Commissioner that the facility has been closed in accordance with the specifications in the approved closure plan. The closure certifications will include Appendix IX test results, all other pertinent analytical data plus the final confirmation sampling results. Included also will be:

- Photographic records of the closure documenting each construction step of the closure process,
- Contractor's daily log, and
- A list of any departure from the approved plan with rationales in accordance with 40 CFR 264.112(c).

In subsequent sections, this Closure Plan provides a description of general methods to be applied and precautions to be taken in closing the hazardous waste storage facilities. Table 1 lists the maximum waste inventory, options for ultimate or partial closure and a schedule for ultimate closure of the units. A summary of specific closure methods applicable to the various systems at this facility are described in detail in the following sections.

The term "area" as used herein signifies each of the container storage areas and tank storage areas being individually gridded and sampled as outlined in Figure 1. The term "unit" on the other hand, applies to the Centralized Waste Storage and Transfer Facility and to each individual building (CWTP-1 through CWTP-6) within the Concentrated Waste Treatment Plant. For example, the unit CWTP-2 (Barrel Building) is comprised of two areas, the container storage area and the tank storage areas.

B. FACILITY DESCRIPTION

P&W East Hartford generates a variety of hazardous waste and receives waste from P&W satellite plants located in Connecticut, Maine and New York. Currently these wastes are managed in eleven (11) storage tanks (8 above ground and 3 underground) and five (5) container storage areas all located within an area known as the Concentrated Waste Treatment Plant (CWTP). These operations are located in an area near the northern end of the East Hartford plant complex. It should be noted that hazardous wastes have never been stored in unit CWTP-5.

Pratt & Whitney is planning to upgrade these facilities. Design work is in progress and construction is planned for 1991. Wastes generated on-site are also managed at other locations within the facility in containers and tanks for less than ninety (90) days.

The building layout and the exact location of the five storage areas at the Concentrated Waste Treatment Plant, covered by the present Closure Plan are shown in Figure 1.

C. CLOSURE REQUIREMENTS

a. General

This section provides a description of general methods to be applied and precautions to be taken in closing the hazardous waste storage areas.

Table 1 lists the maximum waste inventory, options for ultimate or partial closure, and a schedule for ultimate closure of the areas.

In order to determine the effectiveness of the closure activities, surface samples will be analyzed both before and after decontamination. A list of hazardous constituent parameters to be used in establishing the performance standard will be developed for each storage area. These clean standard parameter (CSP) lists will consist of all the 40 CFR 264, Appendix IX parameters (Appendix IX) detected during pre-decontamination sampling, and certain 40 CFR 261 Appendix VIII parameters (Appendix VIII). The Appendix VIII parameters will be selected based on the potential for their presence in any given storage area. The inclusion of specific Appendix VIII parameters will be based on a review of all available information including:

- Storage Records
- Waste Product Records
- Material Safety Data Sheets
- Process Information
- Waste Characterization Information
- * Monitoring Parameters from NPDES-permitted discharge

Prior to decontaminating storage area surfaces, the surfaces will be sampled and analyzed for all Appendix IX constituents. After decontamination, samples of each storage area surface will be analyzed for each of the

parameters on the CSP list in order to demonstrate that the cleanup criteria have been met. A clean standard for each identified parameter on the CSP list will be developed for all exposure pathways. The pathways to be addressed are:

- Direct Ingestion
- Dermal Contact

In addition, the inhalation pathway will be considered during the closure activities and appropriate personal protective equipment will be used.

Health/risk based target standards will be established for each parameter identified and each of the above exposure pathways. The clean standards to be used as specified in the Interim Final RCRA Facility Investigation (RFI) Guidance, EPA 530/SW-89-031, May 1989 are:

- Maximum contaminant levels (MCIs)
- Risk-specific doses (RSD)
- Reference doses (RfD)
- State of Connecticut Action Levels (CTAL).

Later versions of this document may be used if available at the time of closure. The only exceptions to this hierarchy will be if a waste constituent has an RfD lower than its RSD, or if a CTAL is lower than the EPA values. In this case the more stringent values will be used.

In order to establish the clean-up criteria for soil and air, the following performance standards will be used.

If EPA or State of Connecticut recommended exposure limits do not exist for a constituent at the time of closure, the standard will be background levels. If background values are used, they will be statistically verified. Any background values that are shown to be in excess of the health/risk based standards will not be used unless it is demonstrated that the residual constituents are truly indicative of background concentrations and not the result of waste contamination.

Background concrete samples will be collected from areas unaffected by manufacturing processes, or waste or product storage. If possible, concrete samples will be collected from the same phase of construction as the installation of the storage areas themselves. Once the CSP list is developed, specific sample handling and analytical methods will conform to those specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846.

It should be noted that concrete samples have already been collected and analyzed during the construction of the container storage area CWTP-6, prior to storing any waste or other material in these areas.

This testing data is considered representative of background conditions, since it provides information on the composition of the concrete prior to any use of the building.

b. General Closure Requirements

1. Health and Safety - A Health and Safety (H&S) Plan will be prepared in conformance with the requirements found in 29 CFR parts 1910 and 1926, the NIOSH/OSHA/USCG/EPA Guidance Manual for Hazardous Waste Site Activities (NIOSH No. 85-115), and US EPA "Standard Operating Safety Guides".

The Health and Safety Plan will address all hazardous waste activities associated with closure of the units CWTP-1 through CWTP-4 and CWTP-6 at P&W. More specifically, the plan will:

- provide a description of the site,
- identify key personnel,
- assign responsibilities to H&S personnel,
- provide an analysis and evaluation of the hazards associated with each activity,
- specify initial levels of protection required and action levels for additional protection,
- establish training requirements for participating personnel,
- include provisions for medical surveillance,
- describe air monitoring procedures and requirements,

- outline work zones (exclusion, contamination reduction and decontamination zone), and
- describe decontamination procedures for personnel, small equipment and heavy equipment and machinery.

The three work zones are described in further detail below:

(i) Exclusion_Zone:

The Exclusion Zone will isolate the area of contaminant generation and restrict (to the extent possible) the spread of contamination from active areas of the site to support areas and off-site locations. This area will encompass all intrusive work and it will be demarcated by the Hot Line (i.e., a tape or rope line or physical barrier).

(ii) Contamination Reduction Zone:

The Contamination Reduction Zone (CRZ) will start at the Hot Line and extend to the Contamination Control Line. When contaminated personnel, equipment, or materials cross the Hot Line, they are assumed to be contaminated from site operations. Being subjected to the decontamination process, they become less contaminated; when they reach the Contamination Control Line, they are considered clean and can exit this zone without spreading contamination.

Within the Contamination Reduction Zone is the Contamination Reduction Corridor (CRC), where materials necessary for personnel and equipment decontamination are kept. A separate area shall be established for heavy equipment decontamination. In addition, certain safety equipment (e.g., emergency eye wash, fire extinguisher, and first aid kit) are staged in this zone.

(iii) Support Zone:

The Support Zone is the outermost zone of the site, separated from the Contamination Reduction Zone by the Contamination Control Line; it is considered a clean area.

The Support Zone contains the necessary storage of equipment, stockpiling of material, and support facilities (including personal hygiene facilities) for site operations.

The decontamination crew will consist of a minimum of two individuals who will be adequately clothed, including self-contained breathing apparatus, if required, and coveralls. Supervision of the decontamination process will include an individual(s) responsible for operation of the TSDF.

The primary basis for the level of personnel protection selected is determined by:

- The type, toxicity, measured concentration, and permissible exposure limits of the chemical substances.
- The potential or measured exposure to substances in the air, splashes of liquids, or other direct contact with materials due to the work being performed.

The personal protective equipment used to protect the body against chemical hazards is divided into four categories according to the degree of protection:

- Level A Will be worn when the highest level of respiratory, skin, and eye protection is needed.
- Level B Will be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is needed.
- Level C Will be worn when the types of airborne substances are known, the concentrations have been measured, and the criteria for using air-purifying respirators are met.
- Level D This level is used where no respiratory or skin hazards are present. Level D protection is primarily a work uniform providing minimal protection.

It is not anticipated that personnel will need to use Levels A or B, although this determination will be made after the complete CSP list is developed and specific hazardous constituents are known.

2. Sudden or Non-Sudden Release, or Fire Hazard - The decontamination process will be considered as an activity presenting a high risk potential for release of hazardous waste or fire/explosion hazard. As such, the appropriate mechanisms of the Contingency Plan will be ready for activation.

3. Scheduling

Completion of closure will be within 180 days of agency approval of the closure plan or from the last receipt of hazardous wastes; whichever occurs later. The schedule for closure including milestone dates follows:

<u>DAY</u>	ACTIVITY
- 45	Written notification of anticipated closure.
0	EPA and CTDEP approved closure plan or last receipt of hazardous wastes (if that is later).
90	All hazardous wastes disposed of off-site at permitted facilities. Tanks and appurtenances removed and disposed of off-site at permitted facilities.
100	Inspection for residual wastes complete and all damaged areas identified. Samples collected from damaged areas and analyzed appropriately.
120	Floors and equipment cleaned and rinsed. Confirmatory chip samples taken of the concrete containments and soils.
150	Floor and piping repaired and/or sealed as necessary for further use.
180	Completion of closure and certification submittal to the EPA Regional Administrator and CTDEP Commissioner.

All final closure activities will be supervised and certified by an independent registered professional engineer, in addition to P&W personnel.

P&W may require an extension of closure time depending on the season that closure begins.

4. Partial Closure - Partial closure potential for the five facilities has been noted on Table 1. The potential for partial or ultimate closure exists for all units. The procedures described for ultimate closure would be followed for partial closure. The schedule for ultimate closure is provided in Table 1.

5. Certification - The following certification should be submitted to

(Date)

RCRA CLOSURE PLAN
CONTAINER/TANK STOR. F

TABLE 1

CLOSURE PLAN SUMMARY

CWIP

EAST HARTFORD, CONNECTICUT

<u>Item</u>	<u>Process</u>	Process Code		Maximum <u>Inventory</u>	Closure Options Partial/Ultimate	Schedule For Ultimate Closure <u>Start*/Complete</u>	<u>Year</u>
CWTP-1	Treatment Buildings: Container Storage Area	S01]		x	April, September	1993
CWIP-2	Barrel Building: Container Storage Area	S01		37,360 gallons Total	s x	April, September	1993
CWIP-4	Barrel/Transporter Storage Pad	S01	J		· x	April, September	1993
CWTP-6	Container Storage Area	S01		15,400 gallons	s x	April, September	1993
CWTP-2	Barrel Building: Tank Storage Area	S02	}	05 00011	х	April, September	1993
CWIP-3	Underground Oil Tanks	S02]	85,000 gallon Total	x	April, September	1993

^{*}Assumed start date. Completion date based on estimated time of performance of closure.

c. Amending the Closure Plan

P&W will amend the closure plan whenever changes in operating plans or facility design affect the closure plan, or whenever there is a change in the expected year of closure. If a request for permit modification is made to authorize a change in operating procedures or facility design, P&W will also request a modification to the Closure Plan at the same time. If a permit modification is made requiring a change in operating procedures or facility design, P&W will make a request for modification of the Closure Plan within 60 days after the change in plans or design occurs.

d. Closure of Container Storage Areas

This section of the closure plan describes the procedures to be followed during closure of the following areas:

- (1) Treatment Building, Container Storage Area (CWTP-1)
- (2) Barrel Building, Container Storage Area (CWTP-2)
- (3) Barrel/Transporter Storage Pad (CWTP-4)
- (4) Storage Building, Container Storage Area (CWTP-6)

For these areas it is anticipated that the inventory of hazardous wastes remaining at closure will not exceed the maximum inventory value listed in Table 1. For the purpose of this plan all the areas listed above are considered as container storage areas and are discussed jointly below. The procedures for closure of these areas are as follows:

- Collect two composite concrete chip samples from the containment base of each container storage area. Each composite will be made up of several discrete samples collected from discolored, soft or otherwise damaged areas to represent worst case conditions. Each composite sample will then be analyzed for Appendix IX constituents.
- 2. Dispose of all remaining hazardous wastes off-site via licensed vendors for disposal at permitted TSDF's.
- 3. Evaluate the results of Appendix IX analyses and various site-specific records, as discussed in Section C.a above, to establish the clean standard parameter (CSP) list and identify corresponding health/risk based target standards.

- 4. If health/risk based standards do not exist for a specific parameter at the time of closure, a minimum of four background concrete chip samples will be collected and analyzed for the CSP list. This data will be used for comparison in the absence of health/risk based standards.
- 5. A Health and Safety Plan, specific to the site being closed and the CSP list, will be prepared to cover the closure activities to be performed. Details on the Health and Safety Plan have been provided in earlier sections.
- 6. The containment areas will then be scrubbed with the appropriate decontamination solution depending on the type(s) of hazardous waste stored in the area, and thoroughly rinsed with water. A summary of recommended decontamination solutions for various types of hazardous wastes along with the formulations of the decontamination solutions is provided in Table 2.

As an example, a bay used in the past for storage of various types of solvents and other organic compounds in containers, and at times used for storage of alkalies, will have to be decontaminated sequentially with a combination of solutions listed in Table 2. First, the containment area will be scrubbed with a solution containing 5 percent sodium carbonate and 5 percent trisodium phosphate and then it will be triple rinsed with water. After this procedure has been completed, the container storage area will be scrubbed with a dilute solution of hydrochloric acid (1 pint concentrated hydrochloric acid to 10 gallons water) and again triple rinsed with water.

TABLE 2 CLEANER SOLUTION FORMULATIONS

<u>DECON SOLUTION A</u> - A solution containing 5 percent sodium carbonate (Na_2 CO_3 and 5 percent trisodium phosphate (Na_3 PO_4).

To 10 gallons of water, add 4 pounds of sodium carbonate (soda ash) and 4 pounds of trisodium phosphate. Stir until evenly mixed.

<u>DECON SOLUTION B</u> - A solution containing 10 percent calcium hypochlorite (Ca $(Clo)_2$).

To 10 gallons of water, add 8 pounds of calcium hypochlorite. Stir with a wooden or plastic stirrer until evenly mixed.

DECON SOLUTION C - A solution containing 5 percent trisodium phosphate. This solution can also be used as a general purpose rinse.

To 10 gallons of water, add 4 pounds of trisodium phosphate. Stir until evenly mixed.

DECON SOLUTION D - A dilute solution of hydrochloric acid (HCl)

To 10 gallons of water, add 1 pint of concentrated hydrochloric acid. Stir with a wooden or plastic stirrer.

TYPE OF HAZARDOUS WASTE PREFERRED DECONTAMINATION SOLUTION Inorganic acids, metal Α processing wastes Heavy metals, i.e., Α mercury, lead, cadmium Pesticides, fungicides, В chlorinated phenols, dioxins, Cyanides, ammonia, and other В non-acidic inorganic wastes Solvents and organic compounds, C, A such as trichloroethylene, chloroform, and toluene PBBs and PCBs C, A Oily, greasy, unspecified wastes C Inorganic bases, alkali, and caustic waste D

Spent decontamination solutions and rinsewaters will be collected in existing floor sumps or will be contained through the use of dikes to prevent wash water from migrating into clean areas. This rinsate will be collected using a wet/dry vacuum, and disposed of as hazardous waste via licensed transporters to facilities, unless verified permitted disposal be non-hazardous through analytical testing. Similarly, all sweepings, residues or other debris will be disposed of as hazardous waste.

in closure activities will either be equipment used 7. All decontaminated or collected and disposed of as hazardous waste. An equipment decontamination zone will be located within the Contamination Reduction Zone (as outlined by the Health & Safety Plan) and will include a high pressure wash area for equipment vehicles, as needed. Respirators, if used, will be decontaminated daily by setting the cartridges disassembling the masks, placing all parts in a cleaning solution and rinsing them with tap water. Old cartridges, as well as discarded personal protective gear from the decontamination of the container storage areas will be collected and disposed of off-site as hazardous waste. Small manual tools and equipment used during decontamination, such as brushes, gloves, disposable suits, etc., will be collected in a 55-gallon drum and disposed

of as hazardous waste using licensed transporters and permitted disposal facilities. Portions of larger tools (i.e. lifts, hoists) which have come in contact with the waste will be decontaminated by steam cleaning. Particular attention will be paid to tires, under surfaces, points of contact with the ground and horizontal surfaces where dusts or aerosols may have settled. All rinsate generated during decontamination activities will be collected and disposed of as hazardous waste via a licensed vendor, unless verified to be non-hazardous through analytical testing. Additional decontamination procedures will be provided in detail in the Health and Safety Plan.

Once decontamination has been completed as described above, the 8. container storage area will be inspected for cracks or other visible signs of deterioration. If cracks or deteriorated areas are observed during the integrity assessment, then the sampling plan discussed below will be modified to include a representative portion of these areas. If sampling of cracks, gaps or damaged and deteriorated areas in the concrete indicate that hazardous constituents may have migrated below the concrete slab, then additional decontamination and/or partial removal of the contaminated surface will be performed. Additional confirmatory sampling will be performed in these areas. In the unlikely situation that the subgrade underneath the slab is found to be contaminated then the Closure Plan would be modified to include

specific clean-up measures for these areas. For container storage areas that include sumps, one of the samples will be collected from the bottom of the sump.

9. If no cracks, or visible signs of deterioration are found, then non-statistical "judgment sampling" of potentially contaminated areas, based on visual observations, is not possible. Instead, verification sampling will be performed according to the following procedure.

Each of the areas, after decontamination, will be gridded and sampled at locations corresponding to randomly selected grid nodes. The size of the grid interval is determined by this generally accepted mathematical formula:

GI = (A/3.14)^{0.5}/2, where:

GI = grid interval, ft

A = area to be gridded, sq. ft.

The calculated value for the grid interval is then rounded off to the nearest integer and the container storage area is gridded.

The number of samples (n) to be obtained from each slab is determined by the square root of the number of grid nodes. A random number table or generator is typically used to determine which grid nodes or grid areas will be sampled.

Table 3 outlines the calculations of the number of verification samples required to be collected from each storage area to generate statistically viable data according to the

TABLE 3
CONTAINER STORAGE AREAS
VERIFICATION SAMPLING

Item	Process	Area (Sq. Ft.)	Grid Interval(Ft)	No. of. Grid Nodes	No. of Grid Samples	No. of _ Sump Samples	Total No. of Samples
CWIP-1	Treatment Building Container Storage Area	450	6	20	4	1	5
CWIP-2	Barrel Building Container Storage Area	3306	16	25	5	6	11
CWTP-4	Barrel/Transporter Storage Pad	900	8	27	5	1	6
CWTP-6	Storage Building B Container Storage Area	1794	12	21	6	3	9

procedure outlined above. The number of grid samples is the number of samples statistically required. A random number table procedure was used to calculate the exact location of these samples, which are shown in Figure 1 for each of the container storage areas. In addition to these samples, each containment sump will be sampled, raising the number of samples to be collected to the value shown in the last column of Table 3. The locations of the containment sumps are also shown on Figure 1.

All samples will consist of concrete chip samples collected with an air chisel or concrete drill. The portion of the tool in direct contact with the concrete will be cleaned between samples using an industrial non-phosphate detergent wash and a tap water rinse.

The resulting concrete chips will be transferred directly into laboratory supplied glassware. The field QA/QC program for concrete chip samples will include one duplicate for every 10 samples and one trip blank to accompany the samples to the laboratory. Immediately following sample collection, each sample will be labeled and placed in an iced cooler. The samples will be transported under full chain-of-custody to a State of Connecticut approved laboratory.

The analytical testing and determination procedures are presented in Section D of this Closure Plan.

10. If based on an evaluation of the analytical data (comparison to available health/risk based levels or background) the decontamination effects are deemed incomplete, the

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^{*} Please Contact the EPA New England RCRA Records Center to View This Document *

decontamination will be repeated until follow-up sampling that parameters are at or below health/risk demonstrates standards or are consistent with background levels. Any concrete sampling which exhibit levels consistent with chip areas background and either above or below health/risk levels will be considered representative of ambient background levels. Decontamination will then be deemed complete unless it is determined that background samples have been contaminated with the waste.

On the other hand, if repetitive decontamination efforts and subsequent sampling procedures fail to provide satisfactory data, then concrete coring will be performed to determine whether hazardous constituents have reached the subgrade, underneath the concrete slab. If this is the case, P&W will submit a modified Closure Plan to the CTDEP and EPA outling additional specific procedures to be followed for closure of these areas.

11. Complete the certification of closure as presented in Section C(b)(5) of this Closure Plan. Within 60 days of completion of all closure activities, the Certification of Closure will be sent by registered mail to the EPA Regional Administrator and the Commissioner of the Connecticut Department of Environmental Protection.

e. Closure of Tank Storage Areas

This section describes the procedures to be followed for closure of the tank storage areas which include the following:

- (i) Barrel Building Tank Storage Area (CWTP-2)
- (ii) Underground Oil Tanks (CWTP-3)

The barrel building tank storage area consists of eight above ground tanks with secondary containment and several secondary containment areas for ancillary equipment and loading/unloading stations. The second tank storage area consists of three double wall underground storage tanks with a leak detection system and above ground piping. For each of these areas it is anticipated that the inventory of hazardous wastes remaining at closure will not exceed the maximum inventory value listed in Table 1. Furthermore, the total amount of hazardous waste stored in tanks at any given time in the CWTP-2 and CWTP-3 units will not exceed the quantity listed in the Part A Permit Application.

For the purpose of this plan all the areas listed above are considered as tank storage areas and are discussed jointly below. The underground tanks are double wall tanks. Therefore, verification sampling will not be required at closure for the UST's as long as the leak detection system remains functional and a leak has not been detected. Steps 1 through 4, 8, and 10 through 12 do not apply to the UST's. After proper decontamination and clean closure of the CWTP-3 area, the three underground oil storage tanks will be left in place as functional units for as yet undefined future use, such as less than 90 days storage of on-site generated hazardous wastes.

The procedures for closure of the tank storage areas are as follows:

- Collect two composite concrete chip samples from the containment base of each tank and ancillary equipment containment structure. Each composite will be made up of several discrete samples collected from discolored, soft or otherwise damaged areas to represent worst case conditions. Each composite sample will then be analyzed for Appendix IX constituents.
- 2. Dispose of all remaining hazardous wastes off-site via licensed vendors for disposal at permitted TSDF's. Any waste residues remaining in the tanks will be pumped out from the bottom of the tank. Residues remaining in pipings will be flushed out into the tank and also pumped out. A pressure washer will be used as needed to remove additional residues from the tank wall, bottom and associated piping and controls. Caution will be used in entering a confined space, if an entry is required. Rinse solutions and personal protective gear will be compatible with the waste's compatibility grouping. (Additional details will be provided in the Health and Safety Plan). Sludges accumulated at the bottom and/or walls of the tank will be collected and disposed of as hazardous waste via licensed vendors.
- 3. Evaluate the results of Appendix IX analyses to establish the clean standard parameter (CSP) list and identify corresponding health/risk based target standards.
- 4. If health/risk based standards do not exist for a specific

parameter at the time of closure, a minimum of four background concrete chip samples will be collected and analyzed for the CSP list.

- 5. A Health and Safety Plan, specific to the site being closed, and the CSP List, will be prepared to cover the closure activities to be performed.
- 6. all hazardous waste inventory has been removed, all underground waste feed lines will be decontaminated by flushing with the appropriate decontamination solution and then thoroughly rinsed with tap water. After the third rinse the rinsate will be collected and tested for the CSP List. If the rinsate is found to be hazardous, then an additional two-step rinsing procedure The first rinse will consist of a be implemented. will non-hazardous biodegradable degreaser and water solution. This will be followed by a potable water rinse. The rinsate from the second rinse will be collected and tested as above to determine if it is hazardous. If the rinsate is hazardous then the two-step rinsing process will be repeated until the plant tap water rinse is determined to be non-hazardous. All rinsate will be collected and disposed of as hazardous waste. The plant tap water will also be analyzed for the CSP list constituents.
- 7. All above ground and easily accessible underground piping will be removed and disposed of as hazardous waste. The tank itself and any tank components which have not been decontaminated will

either be decontaminated, dismantled and disposed of as non-hazardous waste as described above, or dismantled and disposed of as a hazardous waste without prior decontamination. The adequacy of decontamination procedures will be assessed by collecting wipe test samples. A minimum of three wipe test samples will be collected from each tank following proper decontamination. The cost estimate, presented in Section D of this Closure Plan is based on the assumption that the tank components will be removed and disposed of off-site as hazardous waste.

Disassembly will be performed by manual dismantling and/or by the use of powered equipment. The option is available to use both hot or cold cutting techniques. The size of stockpiled components will be directly influenced by the disposal facility's requirements for landfilling. It is anticipated that all piping will be cut into four foot sections and that larger components will not exceed 10 feet in any dimension.

The three double wall underground oil storage tanks, after decontamination will be left in place as functional units for non-permitted future use such as less than 90 day storage of hazardous wastes generated on-site.

Wipe test samples will be collected from each of the three steel tanks. One wipe sample will be collected from each 100 sf area within the tank. A minimum of three wipe test samples will be collected from each tank and each wipe sample will cover an area of approximately 3 sf (about 0.25 square meters). The wipe test

samples will be used to assess the adequacy of the decontamination procedures. If the results indicate that the decontamination efforts were insufficient, then additional decontamination will follow until wipe test samples produce satisfactory results.

8. After removal of the tank components, as described above, the floor of the concrete containment area will then be scrubbed with the appropriate decontamination solution depending on the type(s) of hazardous waste stored in the area, and then thoroughly rinsed with water. A summary of recommended decontamination solutions for various types of hazardous wastes along with the formulations of the decontamination solutions has been provided in Table 2. The containment area for CWIP-2 includes the tanker pads, sumps, overflow tank, the transporter dump stations and the pump room in the basement. The dump station servicing CWIP-3 would also be included.

Spent decontamination solutions or rinsewaters will be collected in existing floor sumps or will be contained through the use of dikes to prevent washwater migrating into clean areas. This rinsate will be collected using a wet/dry vacuum then disposed of as hazardous waste. Similarly, all sweepings, residues, or other debris will be disposed of as hazardous waste via licensed vendors.

9. All equipment used in closure activities will either be decontaminated or collected and disposed of as hazardous waste.

An equipment decontamination zone will be located within the Contaminant Reduction Zone (as outlined by the Health & Safety Plan) and will include a high pressure wash area for equipment Respirators, if used, will be vehicles, as needed. and decontaminated daily by setting the cartridges aside. disassembling the masks, placing all parts in a cleaning solution and rinsing them with tap water. Old cartridges, as well as discarded personal protective gear from the decontamination of the tank storage areas will be collected and disposed of off-site as hazardous waste. Small manual tools and equipment used during decontamination, such as brushes, gloves, disposable suits, etc., will be collected in a 55-gallon drum and disposed of as hazardous waste us:ing licensed transporters and permitted disposal facilities. Portions of larger tools (i.e. lifts, hoists) which have contacted the waste will be decontaminated by steam cleaning. All rinsate generated during decontamination activities will be collected and disposed of as hazardous waste via permitted TSDFs.

10. Once decontamination has been completed as described above, the tank storage area containments will be inspected for cracks or other visible signs of deterioration. If during the integrity assessment cracks or deteriorated areas are observed, then the sampling plan presented below will be modified to include a representative portion of these areas. If sampling of cracks,

gaps or damaged and deteriorated areas in the concrete indicate that hazardous constituents may have migrated below the concrete slab, then additional decontamination and/or partial removal of the contaminated surface will be performed. Additional confirmatory sampling will be performed in these areas. In the unlikely situation that the subgrade underneath the slab is found to be contaminated then the Closure Plan would be modified to include specific clean-up measures for these areas. Containment sumps will be sampled in addition to the samples discussed above.

If no cracks or other visible signs of deterioration are found, then non-statistical "judgment sampling" of potentially contaminated areas, based on visual observations, is not possible. Instead, verification sampling will be performed according to the following procedure:

Each of the areas, after decontamination, will be gridded and sampled at locations corresponding to randomly selected grid nodes. The size of the grid interval is determined by this generally accepted mathematical formula:

$$GI = (A/3.14)^{0.5}/2$$
, where:

GI = grid interval, ft

A = area to be gridded, sq. ft.

The calculated value for the grid interval is then rounded off to the nearest integer and the tank containments are gridded. The number of samples to be obtained from each slab is determined by the square root of the number of grid nodes. A random number table or generator is typically used to determine which grid nodes or grid areas will be sampled.

Table 4 outlines the calculations of the number of verification samples required to be collected from the Barrel Building, Tank Storage Area. The truck containment pad, containment tank at the barrel building and buried process piping area (ancillary piping for the CWTP-5 Tank Storage Area) will be gridded separately as shown in Table 4 and Figure 1. No sampling is required for the three underground oil tanks (CWTP-3) since secondary containment requirements for this system are met by the utilization of a double wall tank with an interstitial monitoring system assuming that this system has remained operational and a leak has not been detected.

The number of grid samples is the number of samples statistically required. A random number table procedure was used to calculate the exact locations of these samples, which are shown on Figure 1. In addition to these samples, the containment sumps will be sampled, raising the number of samples to be collected to the value shown in the last column of Table 4. The locations of the containment sumps are also shown on Figure 1.

Additional sampling will be performed in the vicinity of the CWTP-2 Tank Storage Area. As shown in Figure 1, five soil samples will be collected and analyzed from trenches created by the removal of underground pipes running from CWTP-2 to CWTP-1. This process piping is buried and only part of it is contained within concrete trenches.

In addition, as shown in Figure 1, certain piping sections run underneath the floor of the CWTP-2 facility. Two soil borings will be performed through the concrete floor in the

CLOSURE OF TANK STORAGE AREAS VERIFICATION SAMPLING

Item	Process	Area (Sq. Ft.)	Grid Interval	No. of Grid Nodes	Total No. of No. of No. of No. of No. of Grid Nodes Grid Samples Sump Samples Samples	No. of Sump Samples	Total No.of Samples
CWIP-2	CWTP-2 Barrel Building Tank Storage Area	1110	Ø	24	ro C	- -	9
	Barrel Building Truck Containment Pad	1800	12	20	4	ဇ	7
	Containment Tank	112	e	20	4	l	4
	Buried Process Piping*	480	9	27	<u>ភ</u>	ı	ഗ
CWIP-3	CWIP-3 Underground Oil Tanks						NA**

NA: Not Applicable

Two additional soil samples will be collected from soil borings underneath the facility's floor (Refer to Figure 1)

No sampling required for these double walled tanks (secondary containment) equipped with a leak detection system. **

(statistical sampling). Other judgmental samples will be collected following an integrity The sump samples (judgmental sampling) will be collected in addition to the grid samples assessment of each of the areas being closed.

CWTP-2 area in the locations shown in Figure 1. The 7 soil samples (five from the buried piping trenches and two underneath the concrete floor) will be used to evaluate whether the soil underneath the buried process piping is clean.

Closure of the process piping section leading from the CWIP-2 area to the Wax Building is being addressed in the Closure Plan for the Burn-Zol incinerator.

All other samples will consist of concrete chip samples collected with an air chisel or concrete drill. The portion of the tool in direct contact with the concrete will be cleaned between samples using an industrial non-phosphate detergent wash and a potable water rinse.

The resulting concrete chips will be transferred directly into laboratory supplied glassware. The field QA/QC program for concrete chip samples will consist of one field duplicate for every 10 samples and one trip blank to accompany the samples to the laboratory. Immediately following sample collection, each sample will be labeled and placed in an iced cooler. The samples will be transported under full chain-of-custody to a State of Connecticut certified laboratory.

The analytical testing and determination procedures are presented in Section D of the Closure Plan.

11. If based on an evaluation of the analytical data (comparison to available health/risk based levels and background), the decontamination process is deemed incomplete, the decontamination will be repeated until follow-up sampling demonstrates that

parameters are at or below health/risk standards or are consistent with background levels. Any concrete chip sampling areas which exhibit levels consistent with background and either health/risk levels will be considered above orbelow representative of ambient background levels and therefore the decontamination efforts will be deemed complete unless background samples are deemed to be contaminated by the waste. On the other if repetitive decontamination efforts and subsequent sampling procedures fail to provide satisfactory data, then concrete coring will be performed to determine whether hazardous constituents have reached the subgrade, underneath the concrete If this is the case, P&W will submit a modified Closure slab. Plan to the CTDEP and EPA outling additional specific procedures to be followed for closure of these areas.

12. Complete the certification of closure as presented in Section C(b)(5) of this Closure Plan. Within 60 days of completion of all closure activities, the Certification of Closure will be sent by registered mail to the EPA Regional Administrator and the Commissioner of the Connecticut Department of Environmental Protection.

D. LABORATORY ANALYSIS AND DATA EVALUATION

a. Laboratory Analysis

The analytical methods that will be used for analysis of concrete samples will be those described in the latest edition of <u>EPA Publication SW-846</u> - <u>Test Methods for Evaluating Solid Waste</u>. The designated laboratory will follow all applicable internal QA/QC procedures outlined in SW-846.

Upon receipt of the analytical data, an initial evaluation of the results will be performed through data validation. Data validation includes a review of field QA/QC procedures (i.e. trip blanks, field duplicates) and laboratory QA/QC procedures (i.e. holding times, blind duplicate analysis, surrogate recoveries). Data points that are not adequately supported by the QA/QC procedures will be referred to the sampling team and/or the laboratory for appropriate corrective actions.

Upon completion of data validation, the results will be compared to background data points and the relevant and appropriate regulatory standards and criteria. An explanation of how this will be performed is presented below.

b. Data Evaluation

As previously stated, decontamination of the storage areas will be demonstrated complete by concrete chip sampling and comparison to regulatory and background levels.

Test results will be compared to the Health/Risk based target standards specified in the interim final RCRA Facility Guidance (EPA-530/SW-89-031). If any parameter exceeds the applicable target standard, then decontamination will be deemed incomplete in the area

of that sample. Decontamination efforts will continue until follow-up sample data achieves the applicable target standard.

For constituents for which a health/risk based standard is not available, comparison will be made to background data. The analytical results of these samples will be statistically analyzed using Cochran's approximation to the Behrens-Fisher Students' t-Test (40 CFR Part 264, If the reported concentration of a specific constituent is Appendix IV). the method detection limit, the numerical value of the method detection limit will be used in calculations. The mean and variance of the background samples will be used to determine if clean standard verification samples contain significant constituent concentrations at a 95 percent confidence level. If any parameter exceeds the corresponding background level, decontamination will be considered incomplete in the area of that Decontamination efforts will continue until follow-up sample data achieves the corresponding background level.

E. MAXIMUM CLOSURE COST ESTIMATE

Maximum closure costs for the six storage areas are estimated to be \$1,097,300 in 1991 dollars. A breakdown of the costs is included in Table 5 through 10. All costs assume performance of closure activities by a qualified third-party contractor. The estimates assume that the maximum waste inventory will be present at closure.

The closure cost estimate will be revised whenever a change in the closure plan affects the cost of closure. The closure cost will be adjusted annually as described in 40 CFR 264.14(b).

All costs provided include overhead for conventional type of work (construction, sampling, decontamination, etc.). The additional insurance costs (estimated at approximately 7%) account for the incremental overhead required for work involving hazardous waste.

TABLE 5 MAXIMUM CLOSURE COST ESTIMATE

STORAGE BUILDING CWIP-1

ACTIVITY DESCRIPTION		<u>005T</u>		
Initial Sampling (Appendix IX) 2 samples x \$4,500/ea: 16 mh x \$60/hr:	\$	9,000.00		
Removal & Disposal of Waste Inventor 12,500 gal x \$8/gal:	ory (1)	\$100,000.00		
Background Sampling & Analysis 2 samples x \$1,200/ea: 16 mh x \$60/hr: Concrete Coring Equip. Rental:		\$ \$ \$	2,400.00 960.00 500.00	
Development of CSP list 60 mh x \$60/hr:	\$	3,600.00		
Development of Health & Safety Plan	\$	3,000.00		
Dismantling and Disposal of Abovegr Tanks and Ancillary Equipment	round		N/A	
Decontamination of Concrete Contair 40 mh x \$40/hr: Equipment Rental:	ments	\$	1,600.00 3,000.00	
Collection & Analysis of Confirmati 5 samples x \$1,200/ea: 16 mh x \$60/hr:	onal Samples	\$	6,000.00 960.00	
Removal and Disposal of Contaminate Allowance (10 tons):	ed Concrete	\$	10,000.00	
Data Evaluation & Closure Certification 80 mh x \$60/hr:			4,800.00	
	Subtotal: Insurance (7%): Contingency (10%):	\$	46,780.00 10,220.00 14,500.00	
	Total (CWTP-1):	\$1	71,500.00	

mh: manhours

^{(1):} Assumes maximum waste inventory present at closure.

TABLE 6 MAXIMUM CLOSURE COST ESTIMATE

STORAGE BUILDING CWIP-2 (CONTAINERS)

ACTIVITY DESCRIPTION	COST		
Initial Sampling (Appendix IX) 2 samples x \$4,500/ea: 16 mh x \$60/hr:		\$ \$	9,000.00 960.00
Removal & Disposal of Waste Inventor 12,500 gal x \$8/gal:	ory (1)	\$10	00,000.00
Background Sampling & Analysis 2 samples x \$1,200/ea: 16 mh x \$60/hr: Concrete Coring Equip. Rental:		\$ \$	2,400.00 960.00 500.00
Development of CSP list 60 mh x \$60/hr:		\$	3,600.00
Development of Health & Safety Plan	1:	\$	3,000.00
Dismantling and Disposal of Abovegr Tanks and Ancillary Equipment	round		N/A
Decontamination of Concrete Contain 40 mh x \$40/hr: Equipment Rental:	ments	\$	1,600.00
Collection & Analysis of Confirmati 11 samples x \$1,200/ea: 24 mh x \$60/hr:	onal Samples	\$ 1 \$	13,200.00 1,440.00
Removal and Disposal of Contaminate Allowance (10 tons):	d Concrete	\$ 1	10,000.00
Data Evaluation & Closure Certification 80 mh x \$60/hr:			4,800.00
	Subtotal: Insurance (7%): Contingency (10%):	\$ 1	54,460.00 LO,800.00 L5,440.00
	Total (CWTP-2): (Containers)	\$18	30,700.00

mh: manhours

^{(1):} Assumes maximum waste inventory present at closure.

TABLE 7 MAXIMUM CLOSURE COST ESTIMATE STORAGE BUILDING CWIP-2 (TANKS)

ACTIVITY DESCRIPTION		COST	
Initial Sampling (Appendix IX) 2 samples x \$4,500/ea: 16 mh x \$60/hr:		\$ \$	9,000.00 960.00
Removal & Disposal of Waste Invento 45,000 gal x \$2/gal:	ry (1)	\$	90,000.00
Background Sampling & Analysis 2 samples x \$1,200/ea: 16 mh x \$60/hr: Concrete Coring Equip. Rental:		\$ \$ \$	2,400.00 960.00 500.00
Development of CSP list 60 mh x \$60/hr:		\$	3,600.00
Development of Health & Safety Plan	:	\$	3,000.00
Dismantle and Disposal of Abovegrou Tanks and Ancillary Equipment 80 mh x \$40/hr: Disposal:	nd.	\$	3,200.00 100,000.00
Decontamination of Concrete Contain 40 mh x \$40/hr: Equipment Rental:	ments	\$	1,600.00
Collection & Analysis of Confirmati 22 samples x \$1,200/ea: 64 mh x \$60/hr:	onal Samples	\$ \$	26,400.00 3,840.00
Removal and Disposal of Contaminate Allowance (20 tons):	d Concrete	\$	20,000.00
Data Evaluation & Closure Certifica 80 mh x \$60/hr:	tion	\$_	4,800.00
	Subtotal: Insurance (7%): Contingency (15%):	\$ \$ \$_	273,260.00 19,140.00 41,000.00
(C	Total: WTP—2, Tanks)	\$	333,400.00

mh: manhours

(1): Assumes maximum waste inventory present at closure.

TABLE 8 MAXIMUM CLOSURE COST ESTIMATE STORAGE BUILDING CWTP-3

ACTIVITY DESCRIPTION	COST		
Initial Sampling (Appendix IX) 2 samples x \$4,500/ea: 16 mh x \$60/hr:		\$ \$	9,000.00 960.00
Removal & Disposal of Waste Invento 30,000 gal x \$2/gal:	ery (1)	\$	60,000.00
Background Sampling & Analysis 2 samples x \$1,200/ea: 16 mh x \$60/hr: Concrete Coring Equip. Rental:		\$ \$ \$	2,400.00 960.00 500.00
Development of CSP list 60 mh x \$60/hr:	\$	3,600.00	
Development of Health & Safety Plan	\$	3,000.00	
Dismantling and Disposal of Undergr Tanks and Ancillary Equipment 60 mh x \$40/hr: Disposal:	round	\$ \$	2,400.00 80,000.00
Decontamination of Concrete Containments 40 mh x \$40/hr: Equipment Rental:			1,600.00 3,000.00
Collection & Analysis of Confirmational Samples 9 wipe samples x \$1,200/ea: 32 mh x \$60/hr:			10,800.00 1,920.00
Removal and Disposal of Contaminated Concrete Allowance (10 tons):			10,000.00
Data Evaluation & Closure Certification 80 mh x \$60/hr:			4,800.00
	Subtotal: Insurance (7%): Contingency (15%):	\$ \$ \$_	194,940.00 13,660.00 29,400.00
	Total:(CWIP-3)	\$	238,000.00

mh: manhours

(1): Assumes maximum waste inventory present at closure.

TABLE 9 MAXIMUM CLOSURE COST ESTIMATE STORAGE BUILDING CWIP-4

ACTIVITY DESCRIPTION		COST	
Initial Sampling (Appendix IX) 2 samples x \$4,500/ea: 16 mh x \$60/hr:		\$ \$	9,000.00 960.00
Removal & Disposal of Waste Inventor 12,500 gal x \$8/gal:	ory (1)	\$	100,000.00
Background Sampling & Analysis 2 samples x \$1,200/ea: 16 mh x \$60/hr: Concrete Coring Equip. Rental:		\$ \$ \$	2,400.00 960.00 500.00
Development of CSP list 60 mh x \$60/hr:	\$	3,600.00	
Development of Health & Safety Plan	\$	3,000.00	
Dismantling and Disposal of Underground Tanks and Ancillary Equipment			N/A
Decontamination of Concrete Contair 40 mh x \$40/hr: Equipment Rental:	ments	\$ \$	1,600.00 3,000.00
Collection & Analysis of Confirmational Samples 6 samples x \$1,200/ea: 24 mh x \$60/hr:			7,200.00 1,440.00
Removal and Disposal of Contaminated Concrete Allowance (10 tons):			10,000.00
Data Evaluation & Closure Certification 80 mh x \$60/hr:			4,800.00
	Subtotal: Insurance (7%): Contingency (10%):	\$ \$ \$_	148,460.00 10,400.00 14,840.00
	Total: (CWIP-4)	\$	173,700.00

mh: manhours

(1): Assumes maximum waste inventory present at closure.

TABLE 10 MAXIMUM CLOSURE COST ESTIMATE

STORAGE BUILDING CWIP-6

ACTIVITY DESCRIPTION		COST
Initial Sampling (Appendix IX) 2 samples x \$4,500/ea: 16 mh x \$60/hr:		\$ 9,000.00 \$ 960.00
Removal & Disposal of Waste Inventor 15,500 gal x \$8/gal:	ory (1)	\$124,000.00
Background Sampling & Analysis 2 samples x \$1,200/ea: 16 mh x \$60/hr: Concrete Coring Equip. Rental:		\$ 2,400.00 \$ 960.00 \$ 500.00
Development of CSP list 16 mh x \$60/hr:		\$ 960.00
Development of Health & Safety Plan	n:	\$ 3,000.00
Decontamination of Concrete Contair 800 mh x \$40/hr: Equipment Rental:	nments	\$ 32,000.00 \$ 3,000.00
Collection & Analysis of Confirmation 9 samples x \$1,200/ea: 32 mh x \$60/hr:	ional Samples	\$ 10,800.00 \$ 1,920.00
Removal and Disposal of Contaminate Allowance (20 tons):	ed Concrete	\$ 10,000.00
Data Evaluation & Closure Certifica 80 mh x \$60/hr:	ation	\$ 4,800.00
	Subtotal: Insurance (7%): Contingency (10%):	\$204,300.00 \$ 14,300.00 \$ 20,400.00
	Total (CWIP-6):	\$239,000.00

mh: manhours

(1): Assumes maximum inventory present at closure.

F. CONTINGENT CLOSURE AND POST-CLOSURE PLAN FOR CWIP-2 TANK STORAGE AREA a. General

This section provides a contingent closure and post-closure plan of the CWTP-2 Tank Storage Area. Although the tanks are provided with secondary containment, sections of the process piping and tank appurtenances associated with the tank system extend outside the tank storage area and do not have secondary containment (refer to Figure 1). Only a small section of the buried process piping associated with the tanks and leading toward the CWTP-1 building is within a concrete trench. Similarly, piping associated with the tank system extends underneath the floor of the CWTP-2 Container Storage Area and is not equipped with secondary containment. The buried process piping section leading from CWTP-2 to the Wax Building is being addressed in the Closure Plan for the Burn-Zol Incinerator.

These areas will be evaluated as described in the Closure Plan provided in Section C.e. If the analytical parameters from soil samples collected underneath the concrete floor of the CWTP-2 Container Storage Area or from the piping trenches leading to the Wax Building exceed the health/risk based standards and are above background levels and therefore, clean closure can not be achieved, then the contingent landfill closure and post-closure plan will be implemented as described in this section.

The main part of the CWTP-2 Tank Storage Area consists of the portion of the CWTP-2 facility that houses, and provides secondary containment, to the tanks. The tanks are placed on a concrete floor which is part of the CWTP-2 facility. Therefore, the area can

essentially be considered covered by the building's concrete floor. No infiltration due to precipitation is expected to reach contaminated soils, if any, since the building is roofed. Any contaminated soil present would be effectively covered. However, the buried process piping leading to CWIP-1, which would already be excavated and sampled according to the Closure Plan, is not covered and is being addressed by the present Contingent Landfill Closure Plan.

As described in the following section, the excavated buried process piping trench will be backfilled with compacted clean fill and a low permeability cap including a 60-mil synthetic membrane liner will be installed to comply with the requirements of 40 CFR 265.197 and 265.310. The multilayer cap will consist of a low permeability bottom layer, a middle drainage layer, and a protective top layer. The cap would:

- Provide long-term minimization of migration of liquids through the closed impoundments;
- 2) Function with minimum maintenance;
- Promote drainage and minimize erosion or abrasion of the cover;
- 4) Accommodate settling and subsidence so that the cover's integrity is maintained; and
- 5) Have a permeability less than or equal to the permeability of natural subsoils present.

b. Contingent Closure of CWTP-2 Tank Storage Area

This section describes step by step the procedures to be followed during the contingent landfill closure of the excavated buried process piping trenches.

Table 11 provides a list of the existing buried process piping along with the size, material of construction, status, and wastes carried in each one. The location of the existing buried process piping is also shown in Figure 2 and is identified by the numbers listed in the first column of Table 11.

The same Health and Safety Plan, specific to the site being closed and the CSP list, that will have already been prepared according to the Closure Plan, will also cover the Contingent Landfill closure activities to be performed.

The buried process piping area, outlined in Figure 2, will be further excavated to a depth of 4 - 5 ft. P&W may elect not to excavate areas which would endanger the stability of a building or would disturb existing utilities.

The impermeable cover will be constructed as described below. The excavated trench will be backfilled with clean fill compacted every 6" to 95% optimum density. A 6" subgrade bedding will be prepared so that it is free of any vegetation, protrusions and rocks larger than 3/4" in diameter. The subgrade bedding will be mechanically compacted to 95% optimum density. The low permeability layer will consist of a flexible membrane liner which will be at least 60 mil thick of high density polyethylene or equivalent material.

The drainage layer will be at least 12" thick with a saturated hydraulic conductivity of not less than 1×10^{-2} cm/sec under normal compactive conditions. The composition of the layer will be medium to coarse sand, not coarser than 3/8", smooth and rounded and should contain no debris, that would damage the underlying flexible membrane

TABLE 11 LIST OF EXISTING BURIED PIPING
(Portions of some lines are in concrete trenches)

()

	Qi			Status	Lo	cation
Number	Size (inches)	Material	Fluid	(Act = Active) (NIU = Not in use)	From	То
1	1 1/2	Steel	Blended Waste	NIU	Basement CWIP-2	Wax Bldg.
2	1	Steel	Soluble Oil	NIU	Basement CWTP-2	Wax Bldg.
3	1	Steel	Soluble Oil	NIU	Basement CWIP-2	Wax Bldg.
4	2	PVC	Blended	NIU	Basement CWIP-1	Wax Bldg.
5	2	PVC	Acid	NIU	Truck Pad 2	Basement CWIP-2
6	2	Steel	Zyglo, Alkali	NIU	Truck Pads 1 and 2	Basement CWIP-2
7	2	Steel	Cyanide	NIU	Truck Pad 1	Basement CWIP-2
8	2	Steel	Blend	NIU	Truck Pad 1	Basement CWIP-2
9	6	PV C	Containment Overflow	ACT	Truck Pad Containments	Buried Hold-
10	6		Containment Drains(Truck Pads 1 and 2)	ACT	Truck Pad Valve Pit	DWW Sump in CWTP-1

P&W - EH RCRA CLOSURE PLAN CONTAINER/TANK STOR. AREAS SEPT. 1991 REV. NO.: 3

TABLE 11 (Continued)
LIST OF EXISTING BURIED PIPING (Continued)
(Portions of some lines are in concrete trenches)

				Status	Io	cation	
Number	Size (inches)	Material	Fluid	(Act = Active) (NIU = Not in use)	From	То	
11	6		Containment Drain (Truck Pad 3)	ACT	Truck Pad 3	Sump in CWIP-1	
12	3	Steel.	Alkali	ACT	Storage Tank	Basement CWIP-2	
13	3	Steel .	Cyanide	NIU	Storage Tank	Basement CWIP-2	
14	3	PVC	Cyanide	NIU	Storage Tank	Basement CWIP-2	
15	3	PVC	Cyanide	NIU	Storage Tank	Basement CWIP-2	
16	2	FRP	Acids	ACT	Acid Containment	Treatment Tanks	
17	2	FRP	Chromic Acid	ACT	Chromic Acid Containment	Treatment Tanks	PEW - RCRA (CONTA: SEPT.
18	2	PVC	Alkali	NIU	Basement CWPT-2	Treatment Tanks	P&W - EH RCRA CLOSURE PI CONTAINER/TANK SEPT. 1991 REV.
19			Dilute Chrome	NIU	Truck Pad 3	Basement CWIP-1	URE P
20	2	PVC	Chromic Acid	NIU	Basement CWIP-2	Treatment Tanks	PLAN NK STOR.
21	4	FRP	Cyanide and Alkali	ACT	Alkali/ cyanide unloading station	Alkali/ cyanide tank containment	AREAS

40

liner, or fines that would reduce the permeability of the layer.

The protective soil layer will consist of a total thickness of 24", of which the lower 15" will consist of compacted clean fill, overlain by 6" of compacted gravel, overlain by two 1 1/2" thick coarses of bituminous pavement. Joint sealer will be placed over the joints of the existing and new bituminous pavement to minimize stormwater infiltration. Additional sampling may be required to determine the extent of the contaminated area to be covered or otherwise remediated.

The extent of the impermeable cover and a typical cross-section, based on the assumption that the contamination is limited to the immediate vicinity of the piping trench, are presented in Figure 2. The synthetic membrane liner, drainage layer, and upper protective soil layer (including the bituminous pavement) will be surveyed upon Once the impermeable cover has been installed and the completion. contingent closure plan has been implemented, P&W will obtain a certification of closure from a licenced Professional Engineer. A survey plat will be submitted to the local land authority (Town of East Hartford), to the Commissioner of the CTDEP and to the Regional Administrator of the EPA. In addition, a notice that the land has been used to manage hazardous waste and the restrictions on the land's use in the future will be recorded on the facility's property deed. A copy of the property deed with the notation will be submitted to the CTDEP and EPA along with the closure certification.

The impermeable cover described above will provide long-term

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minimization of migration of liquids through the closed process piping trenches, since they will be covered by the synthetic membrane. The thickness of the synthetic membrane (60 mil) is such that will prevent rupture from the underlying or overlying material. In addition, the relatively impermeable 3" thick bituminous pavement on top will minimize stormwater infiltration. Furthermore, with the exception of areas in which excavation would endanger a structure's stability, all easily accessible contaminated soils will be removed to a depth of approximately 4 to 5 ft. The groundwater table in the vicinity of the CWTP is relatively shallow and therefore the role of the synthetic membranes in minimizing liquid migration through infiltration is limited only to the amount of native soil lying above the groundwater table.

The impermeable cover will require minimum maintenance since the bituminous pavement will consist of two 1 1/2" thick coarses on a 6" compacted gravel subgrade. The pavement will also provide stormwater drainage with minimum erosion. The concave shape of the synthetic membrane liner will provide drainage of any stormwater infiltration to the native soils on both sides of the membrane. The native soils consist of predominantly sand and gravel which have a higher permeability than the protective soil layer. Settling and subsidence to the cover's integrity will be prevented due to the compaction during the cover's installation as specified above. Further, the cover will be adequately protected from the frost by the 24" protective soil layer, including the 3" bituminous pavement, and the 12" drainage layer.

As part of the Contingent Closure Plan a hydrogeologic study will also be performed in the vicinity of the CWTP-2 building to determine the degree and extent of contamination. The results of the study will be used to develop the groundwater monitoring program for the post closure plan, as discussed in the following paragraph.

A cost estimate for the contingent landfill closure plan is presented in Table 12 based on 1991 dollars. An allowance of \$50,000 is included for the hydrogeologic study.

TABLE 12

CONTINGENT CLOSURE PLAN

COST ESTIMATE

CONTINGENT CLOSURE OF CWIP-2 TANK STORAGE AREA

	ITEM		COST
1)	Trench excavation and removal of		
	buried process piping:	\$	2,000
2)	Disposal of removed process piping:	\$	4,000
3)	Disposal of contaminated soils:	\$	40,000
4)	Cover installation including 6" prepared		
	subgrade, 60 mil synthetic membrane,		
	6" drainage layer, 15" protective soil		
	layer, 6" gravel layer, and 3" bituminous		
	upper layer:	\$	40,000
5)	Preparation of survey plat and		
	certification of closure by a licensed		
	Professional Engineer:	\$	6,000
6)	Hydrogeologic study to determine	\$	50,000
	degree and extent of contamination:	((allowance)
	TOTAL:	\$	142,000
			·····

c. Post-Closure Plan of CWIP-2 Tank Storage Area

The post-closure plan for the CWTP-2 Tank Storage Area identifies the activities to be performed during the post-closure period, i.e. for at least 30 years after completion of closure. During post-closure the area will remain securely covered with a cap which will prevent incidental short-term contact by the public or wildlife which could pose a potential health hazard.

As described in the contingent closure plan of the CWTP-2 Tank Storage Area, a hydrogeologic study will be performed to determine the degree and extent of contamination in the vicinity of the CWTP-2 building. The results of the study will be used to design and implement a groundwater monitoring program.

The groundwater monitoring wells installed according to the groundwater monitoring program developed above will be sampled and analyzed quarterly for the CSP list parameters developed in the closure plan. The analytical data will be evaluated and compared with risk-based standards and background (upgradient well). A report will be prepared quarterly summarizing the analytical data and presenting the result evaluation.

During the post-closure period, P&W will inspect the impermeable cap on a weekly basis. The monitoring wells will be similarly inspected on a weekly basis to ensure that the upper concrete seals, protective casings and caps are in proper operating condition. Specific details of post-closure inspections and monitoring would be developed during the implementation of the contingent closure after

details of the groundwater monitoring program have been developed.

Within 60 days after the completion of the established post-closure care period, P&W will submit to the Commissioner of the CTDEP and to the Regional Administrator of the EPA, Region I, by registered mail, a certification that the post-closure care period was performed in accordance with the specifications in the approved Post-Closure Plan. The certification will be signed by P&W and by an independent registered Professional Engineer.

Table 13, on the following page, presents the cost estimate for the post closure of the buried process piping, while Table 14 presents a summary of all closure and post-closure costs required for closure of the container and tank storage areas CWTP-1, CWTP-2, CWTP-3 and CWTP-4. All estimated costs are in 1991 dollars.

TABLE 13

POST CLOSURE PLAN

COST ESTIMATE

POST CLOSURE PLAN OF CWIP-2 TANK STORAGE AREA

ITEM			COST		
1)	Annual monitoring costs:*	\$	24,000		
	(Quarterly well sampling and analysis)				
2)	Annual data evaluation and report preparation:	\$	12,000		
3)	Annual inspection:	\$	4,000		
4)	Annual maintenance:	\$	5,000		
	TOTAL ANNUAL COST:	\$	45,000		
	30 YEAR TOTAL COST:	\$	1,350,000		

^{*} Assumes 4 groundwater monitoring wells

TABLE 14

SUMMARY OF CLOSURE COST ESTIMATES

CWIP-1 THROUGH CWIP-4 CONTAINER AND TANK STORAGE AREAS

CLOSURE PLAN			
CWIP-1		\$	171,500
CWIP-2, CONTAINERS		\$	180,700
CWIP-2, TANKS		\$	333,400
CWTP-3		\$	238,000
CWTP-4		\$	173,700
CWTP-6		\$	239,000
CONTINGENT CLOSURE PLAN		\$	142,000
(CWTP-2)			
POST CLOSURE PLAN (30 Year Cost)			1,350,000
(CWIP-2)			
	TOTAL:	\$	2,828,300

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SECTION I - OTHER FEDERAL LAWS

At this time, we believe that this facility is in compliance with the following Federal Laws:

- The Wild and Scenic Rivers Act
- The Endangered Species Act
- The National Historic Preservation Act of 1966
- The Coastal Zone Management Act The Fish and Wildlife Coordination Act.

Information will be provided in accordance with the requirements of 40 CFR Part 270.14(b) at the request of EPA Region I.

DATE: 9/5/91

RCRA Part B Permit Application United Technologies Pratt & Whitney CID 990672081

SECTION J - CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SIGNATURE:	K. C. Weleis
,	

Ralph C. Weiss

TITIE: <u>Director</u>, Facilities and Services